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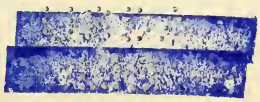
by

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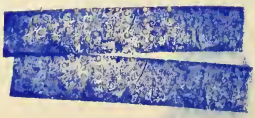


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2153 FLORIDA AVENUE, N. W.
WASHINGTON, D. C.

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by
SAULS PLANOGRAPH COMPANY



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INTRODUCTION

As a taxpayer you have bought and paid for the right to use numerous inventions which have been created for you by your Government. Since you may use these inventions without the payment of any royalties, fees or charges of any kind, you certainly want to know what these inventions are.

Many agencies of the Federal Government have organized research laboratories for making inventions. These laboratories are operated with public funds appropriated by Congress, and they come under the close scrutiny of Congress. Therefore, the inventions developed in these laboratories rightfully belong to the public. You are entitled to know what these inventions are, and the purpose of this book is to furnish information of this kind with respect to one particular agency of the Government, namely, the Department of Agriculture.

This Department has been selected because it deals with the most diverse fields of research of any agency in the Government. Its inventions are, therefor likely to be of interest to more people than those of any other Government agency.

Public service patents are obtained by the Department on inventions made as a result of its research activities to insure the unrestricted use of the inventions by the public. There are two types of public service patents. One type is the dedicated patent, wherein the patent is dedicated to the free use of the public in the territory of the United States. Anyone may freely use the invention covered by such a patent without asking the Department's permission.

The other type of public service patent is the assigned type, wherein the patent is assigned under the control of the Secretary of Agriculture. In order to use the invention covered by such a patent, a license must first be obtained from the Secretary. However, such licenses are currently issued without cost, and no royalties, fees or other charges are made. In some cases, however, these licenses may contain special provisions in the interest of public health and safety. In accordance with a ruling by the Attorney General, such licenses must be non-exclusive, nonassignable and revokable.

When patents are issued by the United States Patent Office, they become a matter of public record and all who wish to do so may obtain copies at 25¢ each. However, in actual practice, it is not feasible for most people to inform themselves of these patents. Everyone who may wish to do so cannot come to Washington and search the records of the Patent Office or afford to pay for a search service periodically in order to obtain copies of patents in which they are interested. Although the weekly Official Gazette of the Patent Office carries information about each patent issued, this information is often too cryptic to be of any substantial benefit in determining the substance of the disclosure in a patent.

This book contains a collection of concise abstracts of public service patents of the Department of Agriculture that have issued during approximately the past fifteen years. In any case where more information is desired, a copy of the patent itself may be obtained from the Patent Office. Further information may be obtained from the Department.

In selecting the patents to be abstracted, certain factors were taken into consideration. In the first place, all patents have been abstracted under which licenses have been issued by the Department. The request for a license under a patent is presumed to indicate that there is definite commercial interest in the invention and that additional interest may be stimulated.

Then, patents which are related to those under which licenses have been issued have been abstracted. Of the remaining patents, since it was necessary to limit the number, greater consideration was given to the more recently issued patents because they are presumed to represent the more advanced stages of the particular arts to which they apply. However, information concerning other patents relating to similar inventions or problems are given whenever appropriate. The degree of advancement in the art of an invention as represented by the breadth of the claims of the patent was also a pertinent factor.

In the abstracts, the assigned patents and the dedicated patents are distinguished from each other by the symbols "(A)" or "(D)", respectively, after each patent number. These symobls are for the information of the reader and should not be used in ordering copies of patents from the Patent Office.

Dr. Max Phillips, some of whose inventions are included in this book, reviewed the manuscript and made many helpful suggestions for which the author is ever grateful.

A. J. K.

To the scientists of the United States Department of Agriculture who have, by their ingenious and praiseworthy discoveries, contributed immeasurably and unselfishly to the welfare of humanity, this book is sincerely dedicated.

WOOD UTILIZATION

RESINOUS CONDENSATION PRODUCT FROM LIGNIN AND FURFURAL

Patent No. 1,750,903 (D) Patent Date: March 18, 1930
Inventor: Max Phillips

Lignin, a component of wood and other plant materials, is readily soluble in furfural. In accordance with this invention a furfural solution of lignin is heated to 100°C. or higher, and a catalyst, such as hydrochloric acid is added. A reaction takes place which results in the formation of a black resinous condensation product which is useful as substitutes for resins of the bakelite type.

* * * * * *

MOLDING COMPOSITION AND A RESINOUS CONDENSATION PRODUCT RESULTING FROM ITS CONVERSION BY HEAT AND PRESSURE

Patent No. 1,923,756 (D) Patent Date: August 22, 1933
Inventors: Earl C. Sherrard and Edward Beglinger

An improved molding composition of a vegetable fibrous material, a phenolic substance and an acid catalyzer is made by partially or wholly freeing the vegetable fibrous material of extractive materials through the use of solvents such as ether, benzene, and the like.

This procedure makes possible a more intimate contact between the phenolic substance and the ligno-cellulose of the fibrous material.

Molding powders made in accordance with this invention when subjected to heat and pressure result in a hard resinous condensation product.

* * * * * *

MOLDING COMPOSITION OF FIBROUS VEGETABLE MINERAL AND FURFURAL

Patent No. 1,932,255 (D) Patent Date: October 24, 1933
Inventors: Earl C. Sherrard and Edward Beglinger

By heating under pressure a hydrolyzed cellulose in the presence of an aldehyde, such as furfural, and a mineral acid, such as hydrochloric acid, an extremely hard and dense, resinous condensation product is obtained in accordance with this invention.

By adding aniline or some other aromatic amine to the mixture, the final product becomes more highly water resistant.

For subsequent improvement, see Patent No. 2,153,316 (A) page 3.

* * * * * *

METHOD FOR SIMULTANEOUSLY SEASONING AND TREATING WATER-SWOLLEN FIBROUS MATERIALS

Patent No. 2,060,902 (D) Patent Date: November 17, 1936

Inventor: Alfred Joaquin Stamm

Fibrous materials, such as wood, hold water on the fiber surface, in the fine capillary structure within the fiber walls, and also mechanically in the coarse capillary structure between the fibers and within the fiber cavities. Removal of water from the latter in seasoning wood has no effect on the properties of the wood. Removal of the intimately held water, however, causes shrinkage which has a detrimental effect by setting up stresses that cause checking, warping and honeycombing.

In accordance with this invention, the intimately held water is replaced with a water-insoluble material in such a way that the fibrous material more completely retains the water swollen dimensions than is possible by previous methods, thus providing a simultaneous seasoning and impregnating process for the fibrous material.

In accordance with this invention, the intimately held water is replaced by a solvent that is completely miscible with water and with the water-insoluble impregnant. The solvent should have a boiling point above that of water. This may be accomplished by immersing the fibrous material in the solvent, alternately applying a vacuum and releasing to the atmosphere. This is followed by distillation of the water. In this condition, the fibrous material is immersed in the water-insoluble substance, the latter being in the liquid phase, until it becomes diffused into the solvent in the fibrous material. The solvent is then distilled off leaving the water-insoluble material in the fibrous material.

Ethylene glycol monoethyl ether, as the solvent, and paraffin, as the water-insoluble material, are given as examples.

* * * * * *

PLASTIC COMPOSITION

Patent No. 2,130,783 (A) Patent Date: September 20, 1938

Inventors: Earl C. Sherrard, Edward Beglinger, John P. Hohf and Ernest Bateman

Sawdust, wood waste, straw, bagasse, and similar vegetable fibrous materials having a ligno-cellulose content are treated with aniline and subjected to heat and pressure to produce a dry powder that can be molded into hard vitreous-like products possessing high strength, moisture and water resistance. It also has excellent dielectric properties.

A lignin plasticizer, such as furfural, may be used, but it is not necessary for manufacturing many products.

* * * * * *

PLASTIC COMPOSITION

Patent No. 2,137,119 (A) Patent Date: November 15, 1938

Inventors: Earl C. Sherrard, Edward Beglinger, John P. Hohf and Ernest Bateman

Pentosan-containing fibrous materials, such as straw, sawdust, wood waste, and bagasse are treated with chlorine and heated to the point of destructive distillation which is indicated by the formation of furfural. An

aromatic amine, such as aniline, is then added resulting in the formation of a water-insoluble thermoplastic furfural resin. Undesirable reaction products are then washed out, leaving a material that can be molded and set under heat and pressure. The molded products are high in strength, moisture and water resistance, and fire resistance. They are also excellent dielectrics.

* * * * * *

PRODUCTS OBTAINED FROM THE HYDROGENATION OF LIGNIN IN THE PRESENCE OF SUITABLE CATALYSTS

Patent No. 2,146,655 (A) Patent Date: February 7, 1939
Inventors: Earl C. Sherrard and Elwin E. Harris

Lignin, a component of wood and other plant materials, is a waste product in the manufacture of products requiring only the cellulose component. By treating this lignin with hydrogen in the presence of a catalyst under certain conditions, various commercial products can be obtained, such as methyl alcohol, water dioxan mixture, p-n-propylcyclohexanol, 4-n-propyl 1,2-dihydroxycyclohexane, 3-p-hydroxycyclohexyl propanol-1. Two suitable catalysts mentioned are copper chromium oxide and nickel (Raney).

* * * * * *

PROCESS FOR THE UTILIZATION OF SAWDUST FOR THE PRODUCTION OF PLASTICS

Patent No. 2,151,412 (A) Patent Date: March 21, 1939
Inventors: Earl C. Sherrard, Edward Beglinger, John P. Hohf, Raymond Mitchell, and Ernest Bateman

This invention provides a method of treating wood waste, preferably ground sawdust or wood flour, to produce an esterified product having molding properties similar to the more highly refined cellulose esters, but being cheaper for use where the clear, colorless properties of the more highly refined cellulose esters are not required.

In accordance with the invention, the sawdust is pretreated to facilitate subsequent esterification. This pretreatment utilizes acetic acid to swell the wood fibers thoroughly. Heat may be used to effect this result, or cooling may be employed to crystallize the acid and disrupt the fibers. A combination of both may be used also.

An acetylating agent, such as acetic anhydride, is then added with a mineral acid catalyst, such as sulfuric and phosphoric acids and the mixture heated to effect the acetylation.

The resulting acetylated wood is then washed and dried, in which form it is ready for molding with or without addition of plasticizers.

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METHOD FOR THE PRODUCTION OF PLASTICS

Patent No. 2,153,316 (A) Patent Date: April 4, 1939
Inventors: Earl C. Sherrard, Edward Beglinger, John P. Hohf and Ernest Bateman

This invention is an improvement over Patent No. 1,932,255 (D) (see page 1) for a process of molding ligno-cellulose containing a plasticizer, such as furfural. The improvement lies principally in the pretreatment of the vegetable fibrous material, such as wood, in order to control the

ratio of lignin to hydrolyzed cellulose in the final product and thereby permit the manufacture of products having any of various obtainable properties. For example, where it is desired to increase the strength of the product, the process is adjusted to provide a greater proportion of hydrolyzed cellulose.

Essentially, the lignin to hydrolyzed cellulose ratio, in accordance with the invention, is controlled by controlling the conditions of cooking the raw material. Cooking is accomplished in an acid bath, such as sulfuric. Where mild cooking conditions are employed, the ratio of lignin to hydrolyzed cellulose is low. The opposite is true of drastic cooking conditions. The cooking conditions can be controlled by regulating the concentration of the acid bath.

* * * * * *

PROCESS FOR MAKING FIBROUS MOLDED PRODUCTS AND MATERIALS
Patent No. 2,190,909 (D) Patent Date: February 20, 1940
Inventors: Max Phillips and Marshall J. Goss

Woody materials, such as sawdust, straw, stalks, leaves, hulls, and cobs, contain the naturally occurring cementing material known as lignin. Its function is similar to that of mortar, and, like mortar, it is not reuseable once it is set.

This invention provides a method for treating such woody materials so as to reactivate the lignin component, and thereby make it possible to make molded articles out of such materials as wood flour, wood wastes, and other lignin-containing agricultural waste products, without the need of any synthetic resin or foreign cementing or binding materials, depending solely upon the cementing properties of the reactivated lignin.

The process comprises heating the lignin-containing material with alcohol, such as methyl, ethyl, propyl, or butyl alcohol, in the presence of an acid catalyst, such as hydrochloric, sulfuric, hydrobromic, or phosphoric acids. The heating is conducted in an autoclave. A temperature at or above the boiling point of the alcohol is used for several hours. The chemically uncombined alcohol is then removed, whereby the lignin is retained in an activated condition. The resulting product can be hardened under pressure, such as by an hydraulic press. Examples show the use of a pressure of 16,000 pounds per square inch.

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PLASTIC CHLORINATED VEGETABLE FIBROUS MATERIAL
Patent No. 2,212,866 (A) Patent Date: August 27, 1940
Inventors: Earl C. Sherrard, Edward Beglinger, John P. Hohf, and Ernest Bateman, deceased, by special administrator

The object of the invention is the provision of a method of treating sawdust, wood waste, and similar cellulosic materials for the purpose of producing a substance that is strong, resistant to water, moisture and fire, and which serves as an excellent dielectric.

The process comprises first chlorinating the material in partial vacuum and then heating it in the presence of air. The material is then washed with hot water to remove all acids and water-soluble reaction products. It is then dried and finely ground. This ground material is mixed with a plasticizer and can then be pressure molded to form a hard, dense, vitreouslike product.

* * * * * *

PROCESS FOR THE HYDROGENATION OF LIGNIN AND WASTE PULP LIQUORS AND THE PRODUCTS THEREOF

Patent No. 2,220,624 (A) Patent Date: November 5, 1940

Inventors: Earl C. Sherrard, Elwin E. Harris and Jerome F. Saeman

The process in general involves the treatment of a solution or suspension of lignin in water, which may be either neutral or alkaline, with hydrogen, in the presence of a catalyst, such as nickel, palladium, platinum, or molybdenum. This treatment is effected under pressures in the range of 1500 to 6000 pounds per square inch and at temperatures not exceeding 300° C. This converts the lignin into heterogeneous products, such as methanol, n-propylcyclohexane and derivatives thereof, organic acids, and high boiling resins.

* * * * * *

PROCESS FOR MAKING RESINOUS CONDENSATION PRODUCTS

Patent No. 2,283,458 (D) Patent Date: May 19, 1942

Inventor: Max Phillips

This invention provides a new composition of matter resulting from the condensation of hemicelluloses with phenolic substances, such as phenols, cresols, naphthols, halogenated phenols, and so forth.

The condensation reaction is effected by means of an acid catalyst, such as sulfuric, hydrochloric, hydrobromic, and phosphoric acids. Any temperature at or above the boiling point of the phenolic-hemicellulosic mixtures may be used.

The product of this invention is thermoplastic. It may be ground to a powder, mixed with a suitable filler such as wood flour, and molded under heat and pressure.

* * * * * *

ANTISHRINK TREATMENT FOR WOOD

Patent No. 2,296,316 (A) Patent Date: September 22, 1942

Inventor: Alfred J. Stamm

The invention is a process for treating wood to reduce permanently its swelling and shrinking.

The wood in dry form is fed into a bath containing a heated liquid, for example, molten metal, such as a low fusion solder, or a fused salt, such as a mixture of sodium and potassium acetate. The wood is kept in the bath for about 1/2 hour, and the bath is maintained at a temperature of about 550° F. Higher temperatures, such as 600° F., would require less time, such as 1/4 hour. A lower temperature, such as 500° F., would require a longer time, such as 1-1/4 hours.

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PROCESS FOR PLASTICIZING LIGNOCELLULOSIC MATERIALS

Patent No. 2,298,017 (A) Patent Date: October 6, 1942

Inventor: William Karl Loughborough

The invention is a process whereby wood is rendered plastic or pliable by treatment with urea or thiourea, or both, and heat.

The inventor discovered that urea (NH_2CONH_2) and thiourea (NH_2CSNH_2) have a marked softening effect upon lignin, cellulose, and other natural constituents of trees and plants. By the use of this discovery, wood can be processed a number of different ways to meet various manufacturing requirements.

The wood is first impregnated with the urea or thiourea or mixtures thereof. It becomes soft and flexible when heated in a dry condition and may be very easily bent, twisted or otherwise deformed. Upon cooling, it resumes its original strength properties. At certain temperatures (about 200° F.) repeated heatings produce repeated softening, but at higher temperatures (about 300° F.), the ability to soften under subsequent heating is lost.

If desired, the chemical may be washed or leached out of the wood any time after it has been deformed to the desired shape. The properties of the wood after leaching will be similar to those of untreated wood.

By adding the chemical to sawdust, a molding powder is obtained for making molded articles by any of the usual molding methods.

For a process of utilizing urea and thiourea in manufacturing wood pulp, see Patent No. 2,361,639 (A) (same inventor), issued October 31, 1944, entitled Process for Defibering Lignocellulosic Materials.

* * * * * *

PROCESS FOR RESINIFYING LIGNOCELLULOSIC MATERIALS

Patent No. 2,313,953 (A) Patent Date: March 16, 1943

Inventor: William Karl Loughborough

Lignocellulosic materials, such as wood, are impregnated with an aqueous formaldehyde urea solution under certain conditions and then heated under pressure to effect resinification.

This produces a compressed product of great density (amount depending on magnitude of pressure applied) and strength.

Before resinification, the wood can be shaped in different forms so that thereafter it is in a permanently fixed form.

Thiourea may be substituted for all or a part of the urea.

The wood is soaked in the solution which is maintained at a pH of about 8 with suitable buffers, then dried and heated under compression at a temperature of about 300° F. until resinification is complete.

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PROCESS FOR MAKING AN IMPROVED PLYWOOD

Patent No. 2,321,258 (A) Patent Date: June 8, 1943

Inventors: Alfred J. Stamm and Raymond M. Seborg

The invention relates to the production of plywood wherein different structural properties are imparted by chemical treatment to different plies of the plywood unit. Plies are impregnated with resin-forming solutions and so treated that the resin becomes bonded with the wood throughout the cell-wall structure of the wood.

According to prior methods, the wood was impregnated with appreciably prepolymerized resins which were too large to enter the cell-wall structure of the wood and, therefore, could not plasticize the cell walls. Consequently, when it was desired, for example, to make a plywood structure having compressed outer plies and uncompressed inner plies, the pressure required to compress the outer treated plies would also compress the inner untreated plies. Therefore, the treated plies had to be compressed first and then glued to the inner untreated plies.

In accordance with this invention, the outer plies are treated with an unpolymerized resin-forming mix, such as phenol and formaldehyde which penetrates the cell-wall structure and plasticizes it. These plies can then be assembled with untreated uncompressed plies and the whole assembly placed under pressure sufficient to compress the treated plies. Due to the plasticity of the treated plies, it will not require as much pressure to compress them as it would to compress the untreated plies. While under this pressure, heat is applied to form the resin in the wood. This resin when formed retains the treated plies permanently in a compressed condition and acts as a bond between the plies which eliminates the necessity for any gluing. In fact this bond is stronger than glue.

The resin is believed to unite chemically with the wood. The material that is formed is very water resistant.

See also divisional Patent No. 2,354,090 (A), entitled Plywood, issued on July 18, 1944.

* * * * * *

PROCESS FOR SIMULTANEOUSLY MANUFACTURING PULP AND HYDROGENATED PRODUCTS FROM LIGNOCELLULOSE

Patent No. 2,328,749 (A) Patent Date: September 7, 1943

Inventors: Earl C. Sherrard and Elwin E. Harris

In general, the invention is a process whereby lignin and hemicellulose are progressively removed from the α-cellulose in wood by converting them into hydrogenated products during the pulping process.

The wood in an aqueous sodium hydroxide medium is heated between 150° and 225° C. under a pressure of 3000 to 6000 pounds per square inch with a catalyst, such as molybdenum, tungsten, nickel, and palladium, in an atmosphere of hydrogen. Under these conditions, the lignin becomes hydrogenated, but the cellulose remains unchanged. The hydrogenated lignin becomes converted into cleavage products which dissolve in the sodium hydroxide solution, permitting removal of the unchanged cellulose.

* * * * * *

WOODEN PANEL

Patent No. 2,332,081 (D) Patent Date: October 19, 1943
Inventors: George M. Hunt, George C. McNaughton and Theodore J. Martin

The object of this invention is to improve the fire resistance of wooden panels for use as solid-case flush doors, bulkheads, and other wooden elements.

In accordance with the invention, the panel is fabricated of a series of wooden strips placed side by side throughout the width of the panel. Grooves are cut deep into the sides of the strip on either side of each joint, and sheets of asbestos are placed in these grooves, each sheet extending into the corresponding grooves on either side of the joints of the strips. The strips are then glued together and the faces of the assembly covered with wood veneers.

This construction prevents the passage of fire through the joints which frequently happens in ordinary panels of this general type when the heat of fire causes separation of the strips at the joints.

Glass cloth, mica, porcelain or other fire-resistive materials may be used in place of the asbestos.

* * * * * *

FLEXIBLE WOOD PRODUCT

Patent No. 2,343,016 (D) Patent Date: February 29, 1944
Inventor: William Karl Loughborough

In a previous patent, No. 2,298,017 (A) (see p. 6), this inventor disclosed a process whereby wood is treated with urea in such a way that it is flexible when hot, but rigid when cold (thermoplastic). In another patent, No. 2,313,953 (A) (see p. 6), he disclosed a method for resinifying the urea after it was placed in the wood and the wood preformed to a desired shape. This gives a product that is rigid at all temperautres. The present invention differs from these previous ones in that the wood is treated so as to make it flexible at all temperatures.

The crux of the invention resides in first treating the wood with urea and then compressing it in accordance with a schedule of temperature and pressure while restraining transversal and longitudinal flow of the wood.

* * * * * *

CARTON

Patent No. 2,345,350 (A) Patent Date: March 28, 1944
Inventors: Lorraine J. Markwardt and Thorwald A. Carlson

This invention is an inexpensive carton of simple construction made of two U-shaped pieces of fiber board and four sticks of wood used as cleats to connect the fiber board pieces together.

The bottom of one of the pieces fits over the bottom of the other, thus providing a double-thickness bottom. The sides of the box, formed by the sides of the two U-shaped pieces are simply secured together with the wooden cleats, one at each corner nailed to both of the adjacent sides.

The carton is designed for strength and rigidity in addition to simplicity of construction.

* * * * * *

WOOD IMPREGNATION

Patent No. 2,350,135 (A) Patent Date: May 30, 1944

Inventor: Alfred J. Stamm

The invention is a process and apparatus for impregnating wood with water solutions. The wood is first heated, then compressed, and, while under compression, placed in a tank of the liquid which is kept cool. The compression is then released and the wood held under as the liquid is sponged up. Apparatus for carrying out this treatment in a practical way is disclosed.

The invention has many potential uses in processes designed to modify structural properties of wood by first introducing into it materials, such as resinifiable agents, and subsequently resinifying the agent in the wood.

* * * * * *

BUILDING PANEL

Patent No. 2,381,469 (D) Patent Date: August 7, 1945

Inventor: Carroll V. Sweet

This invention provides building panels, which may be prefabricated, and which may be nailed to the framework of buildings without the nails passing through the face of the panels.

In one form of the invention, the panels are provided with an upper and a lower horizontal cleat at the back. The upper cleat projects above the upper edge of the panel face and the lower cleat is correspondingly recessed from the bottom edge of the panel face. When a number of such panels are assembled, one above the other, they are secured to the studding by nailing (or other securing means) through the portion of the upper cleat that extends beyond the panel. This portion is covered by the next panel whose lower recessed cleat contacts the upper cleat of the first panel.

By providing the cleats with tongue and groove joints, the lower cleat of each panel is secured to the upper cleat of the panel just below it. Since the upper cleats are fastened to the studding, a rigid construction is obtained.

In another form of the invention, especially designed for outside paneling, the two horizontal cleats of each panel both extend partly beyond the edges of the panel faces and they are secured to the building frame with nails passing through the extending portions of these cleats. The exposed surface of the cleats are then covered with drip caps.

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METHOD OF MOLDING

Patent No. 2,391,489 (A) Patent Date: December 25, 1945

Inventors: Alfred J. Stamm and Harold Dale Turner

This patent covers a method of molding laminated articles in a split mold and is particularly suitable for molding articles having complex curved surfaces, such as airplane propellors, without producing irregularities on the surfaces, internal stresses, and moldflash.

A thin porous material, preferable a fibrous material, such as wood veneer, paper, etc., is first impregnated with a resin-forming solution, such as phenol-formaldehyde. These are then heated under pressure to compress the sheets and partially polymerize the solution. They are then cooled while

under compression to solidify the partially polymerized solution in the plies and hence maintain the compressed form of the sheets.

When the compression pressure is released, the compressed sheets are laid up, one on top of the other, to fill the mold to be used. The stack is then placed in the mold which is closed and heated. The heat at first melts the partially polymerized material, which permits the plies to expand against the walls of the mold and hence to assume the contour of the mold. Continued heating causes the resin to set, if it is thermosetting, after which the article is removed. If a thermoplastic resin is used, the article is cooled before removing it from the mold to permit the resin to set.

* * * * * *

NAVAL STORES

REFINING OF NATURAL OLEORESIN

Patent No. 2,039,481 (A) Patent Date: May 5, 1936
Inventors: Ralph W. Frey and Wiley C. Smith

Crude oleoresin from which turpentine and rosin are made is usually contaminated with tannins and closely related organic compounds.

In accordance with this invention, these contaminants may be removed by treating the oleoresin with a protein that has been tanned so as to be insoluble and resistant to hydrolysis, but yet reactive with the natural tannins.

Suitable materials for this purpose are proteins that have been tanned with chromium, aldehydes, and synthetic tanning materials known as syntans. The shavings and trimmings of untreated tanned hides and skins are indicated as being suitable for this purpose.

* * * * * *

NONCRYSTALLIZING GUM ROSIN

Patent No. 2,176,660 (D) Patent Date: October 17, 1939
Inventors: Samuel Palkin and Wiley C. Smith

In order to obtain a noncrystallizing form of gum rosin, ordinary pine oleoresin is permitted to stand until crystallization of its crystallizable components is substantially complete.

The crystallized portion is filtered off leaving a noncrystallizing filtrate.

See also Patent No. 2,086,777 (D) (Samuel Palkin and Thomas H. Harris, Jr., inventors), issued July 13, 1937, entitled Process for Separating Pine Gum into Fractions.

* * * * * *

STABLE ROSIN ACID, ROSIN ESTER, AND ROSIN PRODUCT CONTAINING THEM AND A METHOD FOR THEIR PRODUCTION

Patent No. 2,239,555 (D) Patent Date: April 22, 1941
Inventors: Elmer E. Fleck and Samuel Palkin

Rosin is stabilized in such a manner that it contains substantially the same proportions of resenes and other neutral materials as normal rosin, by heating it in the presence of a catalyst at a temperature of about 200° C. to 300° C. The catalyst is removed after the rosin has become stable.

Activated carbons, palladium carbon, platinum carbon and nickel carbon are indicated as suitable catalysts. It may take anywhere from 15 minutes to 5 hours to obtain a desired stabilized product.

The invention is not limited to stabilization of rosin, but is applicable also to pine oleoresin and its derivatives.

* * * * * *

PROCESS FOR GUM REFINING

Patent No. 2,254,785 (A) Patent Date: September 2, 1941

Inventors: Wiley C. Smith, Jesse O. Reed, Fletcher P. Veitch and George P. Shingler

Crude oleoresin, the raw material from which turpentine and rosin is made, is refined in such a way that no material is added during the process which is foreign to the original crude oleoresin. Turpentine and water only are added. This avoids the possibility of contamination and results in a bright and transparent rosin.

See also Patent No. 2,295,235 (A) (Jesse O. Reed, inventor), issued September 8, 1942, entitled Process for Producing Rosin.

* * * * * *

PROCESS FOR STABILIZING ROSIN AND PINE OLEORESIN

Patent No. 2,277,351 (A) Patent Date: March 24, 1942

Inventors: William D. Pohle and Wiley C. Smith

In accordance with this invention, the stability of rosin and pine oleoresin to oxygen absorption is increased by heating it at temperatures between 300° to 400° C. at a pressure of at least 300 pounds per square inch. Pressures above 2000 pounds per square inch are of no added benefit. The rosin is converted to a stable product containing stable rosin acids. The volatile fraction is distilled off leaving the stabilized product. No catalyst is needed to effect the conversion, and the reaction does not result in the formation of rosin oil.

Such stable products are valuable in the manufacture of many commercial products, such as soaps, sizes, and varnish resins.

The product resulting from the use of this method is indicated as having an acid number in the range of 160-175.

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PROCESS FOR REFINING OLEORESIN

Patent No. 2,307,078 (A) Patent Date: January 5, 1943

Inventor: Jesse O. Reed

The invention is a process for refining oleoresin in emulsion form by first diluting it with turpentine to break the emulsion and then washing it with water in a specified manner.

The oleoresin is first filtered and then diluted with turpentine so that it contains at least 35% turpentine. This causes the oleoresin to float on water. Thus the diluted oleoresin can be introduced into the bottom of a static column of water. As it rises through the water, it becomes washed. When it reaches the top, it is removed and passed through a jet of water to break it up into small particles to form a temporary emulsion with the water. While this condition exists, the emulsion is introduced into another column of water where it is again washed while rising to the top and is recovered in a refined condition.

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PROCESS FOR REFINING TURPENTINE

Patent No. 2,308,715 (D) Patent Date: January 19, 1943

Inventor: Jesse O. Reed

Turpentine is a component of oleoresin and is separated from it by distillation. The turpentine collected from the turpentine stills is in an impure state. It is mixed with what is known as "low wines."

The purpose of this invention is the provision of a simple and inexpensive process of purifying the turpentine thus obtained from the stills by removing the "low wines" and other impurities that contribute to contamination of the turpentine when stored in metal containers.

In accordance with the process, as much of the "low wines" as possible is first separated out by gravity. The remainder is introduced at the bottom of a column of course granular salt. The "low wines" present, being essentially acidic water, will dissolve part of the salt and form a brine which separates from the turpentine by gravity. Further purification of the turpentine after separating it from the brine is accomplished by spraying into the bottom of a column of cool water. The turpentine floats to the top in small droplets and is thereby washed. It is then withdrawn from the top of the column of water where it collects and is introduced at the bottom of another column of granular salt, the purpose being to dry the turpentine by removing water it may have picked up during the previous washing step. In this second column of salt, any water present in the turpentine dissolves the salt and forms a brine from which the turpentine is then separated, this action being similar to that in the first column of salt.

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FRACTIONATING APPARATUS

Patent No. 2,319,365 (A) Patent Date: May 18, 1943

Inventor: Jesse O. Reed

This invention provides an apparatus for separating mixtures of materials having different melting points, solubilities and viscosities. It is especially useful for fractionating materials which are highly viscous and agglomerated with foreign matter, such as is found in crude oleoresin.

The apparatus in one form consists of a vertical chamber, the walls of which are formed by a number of vertical tubes, with small openings between adjacent tubes. The tubes are heated progressively so that the hottest part is at the bottom and the coolest part at the top.

The material to be fractionated is placed in the chamber formed by the tubes. As it passes downward through different zones of heating different fractions of material melt and pass out through the openings between the tubes. Means are provided separately to carry off at different elevations melted material passing through these openings. Other auxiliary means are provided to facilitate the use of the apparatus.

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APPARATUS FOR WASHING OLEORESIN

Patent No. 2,322,252 (A) Patent Date: June 22, 1943
Inventor: Jesse O. Reed

This invention provides an apparatus for the continuous washing of crude oleoresin for the purpose of refining it.

The apparatus comprises a long vertical column at the middle of which is a restricted area. At this restricted area, hot water is fed downwardly through a pipe. Below this point, a section of the column is filled with a packing material, such as a ceramic tower packing, folded pieces of wire mesh, "glaucosil," or other suitable materials. Crude oleoresin is fed into the column at the bottom of the packing through a pipe. The oleoresin is preferably heated, filtered and diluted to a turpentine content of at least 35% before being introduced.

The hot water and diluted oleoresin travel countercurrently through the packing material. Due to the difference in gravity, the level of the oleoresin rises above that of the water into the upper part of the column from which water settles and the refined product is removed from the top. The upper part of the column is kept filled with oleoresin by means of a siphon tube, the lower end of which is connected to the bottom of the column. The upper end terminates near the top. This siphon tube also acts as the discharge tube for the wash water. By closing a valve in the tube at the end of a run, all the washed oleoresin in the upper part of the column can be discharged through the top.

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PROCESS FOR REFINING PINE OLEORESIN

Patent No. 2,359,980 (D) Patent Date: October 10, 1944
Inventor: Elmer E. Fleck

This invention provides a method of manufacturing the addition product of 1-pimaric acid and maleic anhydride in a substantially pure form.

Due to the greater content of d-pimaric acid and dihydropimaric acid in this new modified rosin product as compared to ordinary rosin and the very low content of 1-pimaric isomerization products, it is more stable toward oxidation and hence is better suited for the manufacture of ester gums, paper sizes, and other commercial products.

In accordance with the invention, pine oleoresin substantially free from water is dissolved in a low boiling aliphatic hydrocarbon, such as petroleum ether, heptane, heptene, hexane, hexene, pentane, pentene, propane, etc., and turpentine. Maleic anhydride is added to the solution and permitted to react with the 1-pimaric acid at a temperature below 75° C. The resulting addition product is insoluble in the solvent and may be separated by filtration.

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PRODUCTION OF ROSIN AND TURPENTINE

Patent No. 2,363,692 (A) Patent Date: November 28, 1944
Inventor: Jesse O. Reed

The invention provides an apparatus for processing crude oleoresin to obtain turpentine and rosin.

A series of vertical columns is provided. In the first one, the oleoresin is sprayed downwardly and steam is sprayed upwardly. The steam volatilizes the turpentine which is carried off and recovered.

The remaining material is passed through the other columns and treated in a similar way to remove residual turpentine and water, and the rosin is finally collected after all the water is removed.

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PROCESS FOR TREATING CRUDE PINE TARS

Patent No. 2,364,104 (A) Patent Date: December 5, 1944
Inventor: Wiley C. Smith

The process of this invention has for its purpose the treatment of crude kiln pine tar for the purpose of removing free and dissolved water, undissolved solid extraneous matter, and a portion of the heaviest and most viscous component of the tar.

Kiln pine tar refined in this way has enhanced value as a paint constituent. Its corrosiveness to metal is reduced by the absence of the water.

Essentially, the process comprises adding to the crude material a solvent, such as carbon tetrachloride, chloroform, coal tar hydrocarbons, petroleum distillates, and spirits of turpentine. The solvent should have a distillation temperature below 175° C. and a specific gravity widely divergent from 1.05, which is usually the specific gravity of the aqueous portion of the tar. The tar itself has a specific gravity of about 1.08. This small difference in specific gravity makes it so difficult to separate these two portions of the crude material by ordinary methods. However, diluting the tar in this way not only decreases the viscosity of the tar, but changes its density so that the extraneous matter can be separated by gravity from the diluted tar. The solvent and dissolved water in the separated diluted tar can then be driven off by distillation.

See also Patent No. 2,379,662 (A) dated July 3, 1945 (same title and inventor) for similar process.

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METHOD FOR REFINING AND DISTILLING OLEORESIN

Patent No. 2,377,183 (A) Patent Date: May 29, 1945
Inventor: Jesse O. Reed

Oleoresin, the source of turpentine and rosin, is a viscous material, and in order to refine it, some refining processes require its dilution with turpentine. However, turpentine when exposed to the air changes in composition and chemical properties. The use of turpentine, which has been exposed to the air for some time, as a diluent for oleoresin in refining processes, therefore, results in certain impurities from oxidation being added to the oleoresin which becomes incorporated in and thus contaminates the rosin.

To avoid this contamination, this invention teaches the use of turpentine vapors to dilute the oleoresin prior to refining it. These vapors may be obtained and mixed with steam from the exhaust of the distillation apparatus where turpentine is distilled from a previous batch of oleoresin. This results in an economy of heat.

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FERTILIZERS AND SOIL TREATMENT

FERTILIZER MATERIAL AND PROCESS FOR MANUFACTURING THE SAME

Patent No. 1,858,230 (D) Patent Date: May 10, 1932
Inventors: George P. Walton and Robert F. Gardiner

Peat which is a good soil conditioner (mechanical) is a very poor fertilizer due to the fact that its nitrogen content is in a form that cannot be utilized by plants.

The invention provides a process for converting peat into a satisfactory fertilizer.

In accordance with the process, the peat is treated by incorporating it with and digesting it in a hot melt of mono-potassium phosphate and phosphoric acid. Water is added to the resulting mixture. Any excess acid is neutralized with ammonia before drying.

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PROCESS FOR AMMONIATING ORGANIC MATERIALS

Patent No. 2,027,766 (D) Patent Date: January 14,1936
Inventors: Royall O. E. Davis and Walter Scholl

By means of this invention, organic materials of plant origin, such as peat, wood waste, leather scrap, etc., can be enhanced in their value as fertilizer ingredients. The available nitrogen content is increased, and the materials are rendered more readily decomposable in the soil.

The invention comprises treating the material with ammonia gas under conditions permitting the gas to be absorbed by the material. An autoclave is preferably used, and the amount of gas absorbed will depend upon the temperature and pressure conditions. A temperature in the range of 180^{o} to 300^{o} C. is specified for 8 to 24 hours.

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MOLECULAR ADDITION COMPOUND OF CALCIUM SULPHATE AND UREA

Patent No. 2,074,880 (D) Patent Date: March 23, 1937
Inventors: Colin W. Whittaker and Frank O. Lundstrom

By reacting a mixture of calcium sulphate dihydrate, also known as gypsum, and urea in a saturated aqueous urea solution, the addition product $CaSO_4.4CO(NH_2)_2$ is formed.

Although gypsum contains none of the important plant food elements, it is frequently used as a soil conditioner. In forming the addition product of this invention, the valueless water of crystallization of the gypsum is replaced by urea which contains 46.7% of the valuable plant food nitrogen in a readily available form. The addition product, being less hygroscopic than urea, is less likely to become sticky when exposed to humid atmospheres.

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PROCESS FOR OXIDIZING PHOSPHORUS

Patent No. 2,107,857 (A) Patent Date: February 8, 1938

Inventor: Paul H. Emmett

From the reaction of phosphate rock and carbon in commercial furnaces, elemental phosphorus is produced. It passes out as a vapor in a gaseous mixture. It is desirable to convert this phosphorus vapor to pentavalent phosphorus. Previous methods were inefficient either in the evolution of large amounts of heat or the production of phosphorus products other than those of the pentoxide form.

This invention provides a method whereby phosphorus pentoxide is the sole product and only a relatively small amount of heat is evolved. This makes it possible to react the phosphorus pentoxide with phosphate rock to form a product that is essentially calcium metaphosphate, a valuable fertilizer material.

In accordance with the invention, the phosphorus vapor, mixed with proper proportions of CO and CO_2, is passed into a bed of phosphate rock ($CaSO_4$ or $CaCO_3$ may also be used) at a temperature of at least 900° C., preferably about 1200° C. Some oxygen may also be included. All the phosphorus is thus oxidized to the pentavalent form which combines with the rock to form the calcium metaphosphate.

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PROCESS FOR THE PRODUCTION OF MONOCALCIUM CHLOROPHOSPHATE

Patent No. 2,143,438 (A) Patent Date: January 10, 1939

Inventor: Edward J. Fox

By means of this process monocalcium chlorophosphate can be manufactured free of calcium chloride from phosphate rock and therefore can be used for fertilizer purposes. It contains a high percentage of soluble phosphate. This result was very difficult to accomplish by previous methods.

In its broad aspects, the invention comprises dissolving the phosphate rock in hydrochloric acid. Insoluble gangue is removed from the resulting solution. Phosphoric acid is then added to the solution in amounts such that equimolecular amounts of calcium chloride and phosphoric acid are present. Hydrochloric acid gas is evolved, and a precipitate of monocalcium chlorophosphate is obtained. The final mixture is evaporated to dryness.

See patent on page 20, for production of dicalcium orthophosphate and ammonium chloride from monocalcium chlorophosphate.

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SOIL ADJUVANT

Patent No. 2,187,532 (D) Patent Date: January 16, 1940

Inventor: Martin Leatherman

This invention teaches that it is beneficial to add rosin to soils, especially in the respect that it retards microbiological competition for nitrogen with growing plants.

When added in a combined form with a fungicidal or bactericidal metal, such as copper, cadmium and zinc to form resinates, the beneficial effects are enhanced.

Other resinates may be used such as those of manganese, calcium, magnesium, aluminum, sodium, potassium, iron and titanium. The low solubility of these resinates prevents injury in cases where uniform distribution is not attained.

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PROCESS FOR MAKING SYNTHETIC MANURE

Patent No. 2,218,695 (D) Patent Date: October 22, 1940
Inventor: Martin Leatherman

Plant residues, such as straw, leaves, stalks, and so forth, are treated with water solutions of inorganic nutrient salts, such as potassium dihydrogen phosphate, magnesium sulphate, potassium chloride, and potassium nitrate. There is also added as an important ingredient a chemical which will destroy the water repellancy of the plant residue, thereby permitting the nutrient solution to become dispersed uniformly throughout the residue material in a short time. The material treated in this way is then stored in such a way that the moisture content is maintained. One method of doing this is to bury the treated material in the ground. As an alternative, water lost by evaporation may be replaced from time to time. These conditions insure luxuriant growth of microorganisms with resulting fermentation and decomposition of the plant material.

Suitable materials for destroying water repellency are water-soluble salts of sulphate esters of fatty alcohols containing twelve or more carbon atoms in straight or branched chains, sulphonated wool fat, sulphonated pine oil, and so forth. In general, any wetting agent can be used that does not inhibit fermentation.

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PROCESS FOR THE PRODUCTION OF CALCIUM METAPHOSPHATE AND HYDROGEN

Patent No. 2,273,461 (A) Patent Date: February 17, 1942
Inventors: Stephen Brunauer and John Floid Shultz

The object of this invention is to provide an improved process for oxidizing phosphorus and for obtaining hydrogen as a by-product.

Prior art methods are considered wasteful and difficult. In accordance with this invention, phosphorus and steam are reacted together as they are passed through a bed of phosphate rock. The phosphoric pentoxide produced reacts with the phosphate rock to form a product that is essentially calcium metaphosphate and is recovered in the molten state. The hydrogen evolved contains gaseous impurities. These impurities can be removed by scrubbing with alkali.

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PROCESS FOR THE PRODUCTION OF NON-CAKING FERTILIZER MATERIALS

Patent No. 2,307,253 (A) Patent Date: January 5, 1943
Inventors: Jew Y. Yee and Royall O. E. Davis

Many salts or compounds in powder, crystalline or granular form have a tendency to cake and form more or less solid masses under alternations of humidity and temperature.

This is particularly objectionable in the case of fertilizer materials since the caked materials must be broken up by the expenditure of much labor and time in order to render them suitable for uniform distribution in the field and to prevent clogging of distribution machinery.

The invention covered by this patent is a process to reduce the tendency of granular, ammonia-soluble materials to cake on standing.

The process comprises agitating the material, such as ammonium nitrate, sodium nitrate, and urea granules, in the presence of ammonia gas with an added finely pulverized non-caking material which does not dissolve in ammonia, such as magnesia, silicious compounds, carbon, limestone, peat dust, cocoa shell meal, cottonseed meal, and so forth.

The pulverized material forms a coating on the granules which mixes with a film of solution of the granular material on its surface formed by the ammonia gas. When the ammonia is allowed to evaporate, the fine particles become fixed to the surface of the granular material as an integral part of it.

See also Patent No. 2,297,300 (A) (John O. Hardesty and William H. Ross, inventors), issued September 29, 1942, for Process for the Granulation of Crystalline Material, and Patent No. 2,287,759 (A) (John O. Hardesty , Kenneth O. Jacob and William H. Ross, inventors) issued June 23, 1942, for Process for the Granulation of Fertilizers.

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PROCESS FOR THE PRODUCTION OF DICALCIUM PHOSPHATE AND AMMONIUM CHLORIDE

Patent No. 2,353,658 (A) Patent Date: July 18, 1944
Inventor: Edward J. Fox

This invention carries a step further the process taught in Patent No. 2,143,438 (A) (see page 18), for the production of monocalcium chlorophosphate. This material in a form substantially free of calcium chloride is reacted with ammonium gas, resulting in a mixture of dicalcium orthophosphate and ammonium chloride. The dicalcium orthophosphate is useful as a fertilizer material.

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INSECT, FUNGUS AND WEED CONTROL

PROCESS FOR THE REMOVAL OF RESIDUAL POISONS FROM AND THE PRESERVATION OF FRUITS

Patent No. 1,708,330 (D) Patent Date: April 9, 1929
Inventors: Reginald H. Robinson and Henry Hartman

Spray residues, such as arsenic, lead, copper, and lime, that remain on fruit after they are picked can be removed by this process. Also, various molds, such as blue and gray molds, brown rot, anthracnose, perennial canker, and other allied forms that cause decay of deciduous fruits can be overcome by the treatment. Specific fruits mentioned are apples, pears, plums, prunes, cherries, grapes, currants, gooseberries, raspberries, strawberries, blackberries, plumcots, apricots, nectarines, quinces, and so forth.

The process comprises washing the fruit with a water solution of hydrochloric acid and formaldehyde. For most purposes a concentration of from 0.3 to 2% of the hydrochloric acid is optimum. One part of formaldehyde to 50 to 160 parts of water or acid solution may be used.

Patent No. 1,885,100 (D), issued October 25, 1932 (Reginald H. Robinson, inventor), entitled Process for the Removal of Spray Residues from Fruits and Vegetables, teaches the use of a washing solution comprising a mixture of hydrochloric acid and certain sulfates, such as sodium, copper, and iron sulfates.

Where the problem of removing natural oils and wax in addition to spray residues is involved, Patent No. 1,884,966 (D), issued October 25, 1932, (Reginald H. Robinson, inventor), teaches the use of a solution of liquid petroleum hydrocarbons, hydrochloric acid and water.

See also Patent No. 2,046,546 (D), dated July 7, 1936 (Roscoe H. Carter, inventor), disclosing similar process using hydrochloric or sulfuric acid with an aluminum salt, such as aluminum sulfate and aluminum chloride. In companion Patent No. 2,046,547 (D), (same date and inventor), the corresponding ferric salts are used.

Another similar process is disclosed in Patent No. 2,046,548 (D), dated July 7, 1936 (Roscoe H. Carter and Jack E. Fahey, inventors), wherein a mixture of hydrochloric or sulfuric acid and boric acid is disclosed.)

Patent No. 1,975,361 (D), issued October 2, 1934 (Arthur M. Henry, inventor), covers use of dilute solutions of alkalis, such as ammonium hydroxide, sodium hydroxide, sodium carbonate, and sodium bicarbonate for removing poisonous spray residues, especially arsenical spray residues, from fruits and vegetables. In Patent No. 1,967,176 (D), issued July 17, 1934, to same inventor, the use of dilute solutions of strong acids, such as sulfuric, hydrochloric, and nitric, are covered for the same purpose. The alternate use of alkali and acid solutions is also covered.

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PROCESS FOR THE TREATMENT OF FRUIT FOR THE PREVENTION OF DECAY

Patent No. 1,704,072 (D) Patent Date: March 5, 1929
Inventor: William R. Barger

Fresh fruits, especially citrus fruits, may be treated by this process to prevent decay caused by blue and green molds and other fungi. Specific fungi mentioned are: Penicillium digitatum, Penicillium italicum, Pythiacystis citri, and Diplodia natalensis.

The process comprises simply treating the fruit with a solution of cadmium sulphate ($3CdSO_48H_2O$) in a concentration in the range of 1 part by weight to 200 parts of water to 4 parts by weight to 100 parts of water. The concentration to be used in any particular case depends on the vigor of the fruit and the character of its decay injury.

The treatment may be effected by spraying, immersing or otherwise wetting the fruit with the solution.

See Patent No. 1,704,073 (D), which is identical to the above except that cadmium chloride ($CdC1_22H_2O$) is used. See also Patent No. 1,704,456 (D), covering treatment with a solution of both cadmium sulfate and cadmium chloride. All three patents were issued on March 5, 1929.

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MATERIAL FOR KILLING INSECTS

Patent No. 1,789,322 (D) Patent Date: January 20, 1931
Inventors: Ruric C. Roark and Richard T. Cotton

Esters of halogenated fatty acids are indicated as being effective insecticides. They may be used for fumigating wheat and other cereals and are advantageous in that they are not dangerously toxic nor highly disagreeable to those handling the material. They are also reasonably free of fire hazards when mixed with non-inflammable liquids, such as carbon tetrachloride. They will not injure the milling and baking qualities of wheat, do not bleach or otherwise injure clothing and fabrics, and do not corrode metals.

Particular esters mentioned are those of chloroformic, monochloroacetic, dichloroacetic, trichloroacetic, monobromoacetic, beta-chloropropionic, and alpha- and beta-bromopropionic acid.

The chloro-substituted fatty acids are preferred, the esters of monochloroacetic acid being the best, the methyl, ethyl, isopropyl, normal butyl and secondary butyl being particularly suitable.

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INSECTICIDE AND FUMIGANT

Patent No. 1,791,429 (D) Patent Date: February 3, 1931
Inventors: Ruric C. Roark and Richard T. Cotton

The invention resides in the use of ethylene oxide as an insecticide and fumigant.

It is indicated as being lethal to specimens of the clothes moth, carpet beetles, the rice weevil, the Indian meal moth, the saw-toothed grain beetle, the red-legged ham beetle, and the flour beetle.

Ethylene oxide is not toxic to man, but when inhaled for a long time, it produces a cyanoses, which, however, is counteracted by the use of carbon dioxide gas. It does not injure clothing and fabrics.

It can be used to fumigate wheat and other grains without injuriously affecting the milling properties of the grain or the baking qualities of the flour made from the grain.

For commercial fumigation, the use of 2 pounds per 1,000 cubic feet of space is recommended.

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PROCESS FOR THE TREATMENT OF FRUIT FOR THE PREVENTION OF DECAY

Patent No. 1,797,573 (D) Patent Date: March 24, 1931
Inventors: Harry R. Fulton and John J. Bowman

This invention provides a treatment for fruit, particularly citrus fruit, to prevent stem end rot and decay caused by green and blue molds and other organisms.

The treatment comprises the application of an aqueous solution of certain salts of manganese in which the manganese is combined with a strong acid, such as manganese chloride and manganese sulphate.

Companion Patent No. 1,797,572 (D), issued on same day, covers use of sodium aluminate for the same purpose.

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PROCESS FOR THE MANUFACTURE OF INSECTICIDES AND METHOD OF MAKING SAME

Patent No. 1,863,519 (D) Patent Date: June 14, 1932
Inventor: Roscoe H. Carter

Insecticidal compounds consisting of double fluorides of the alkali metals with aluminum are prepared by treating a water-soluble salt of aluminum with a water-soluble alkali metal compound in the presence of water and hydrofluoric acid.

A specific example is the double fluoride of potassium and aluminum or potassium hexafluoaluminate (K_3AlF_6). The following reaction is indicated:

$$Al_2(SO_4)_3.18H_2O + 12KOH + 12HF = 2K_3AlF_6 + 3K_2SO_4 + 24H_2O.$$

See companion Patent No. 1,863,266 (D), issued on same day and having same title, wherein hydrofluosilicic acid (a waste product of certain industrial processes) is used, instead of hydrofluoric acid, to form the same compound in accordance with the equation:

$$Al_2(SO_4)_3.18H_2O + 12KOH + 2H_2SiF_6 = 2K_3AlF_6 + 2SiO_2 + 3K_2SO_4 + 26H_2O.$$

See also Patent No. 1,842,443 (D), issued on January 26, 1932 (same inventor and title), wherein the same insecticide is made by the reaction of aluminum oxide, potassium hydroxide and hydrofluoric acid in accordance with the equation:

$$Al_2O_3 + 6KOH + 12HF = 2K_3AlF_6 + 9H_2O.$$

PROCESS FOR MAKING AN INSECTICIDE

Patent No. 1,928,968 (D) Patent Date: October 3, 1933

Inventor: Howard A. Jones

The insecticide rotenone is dissolved in acetone, diacetone alcohol, or other water-soluble solvent containing one or more keto groups. This solution is then mixed with water in the presence of a protective colloid, such as tannic acid (tannin). This results in a collodial suspension of rotenone. The rotenone is in an extremely fine state of subdivision which enhances its activity as an insecticide.

Moreover, the rotenone does not separate when the suspension is allowed to stand for an extended period of time. This method avoids the use of aqueous solutions of alkalies which decompose rotenone.

See also Patent No. 1,928,256 (D), issued September 26, 1933 (same inventor), entitled Insecticide and Process for Making the Same, in accordance with which a colloidal suspension of rotenone is effected by dissolving it in pyridine and then adding the solution to water. The use of a protective colloid is not necessary in this instance.

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PROCESS OF EXTRACTING ROTENONE FROM PLANT MATERIAL

Patent No. 1,942,104 (D) Patent Date: January 2, 1934

Inventor: Howard A. Jones

In accordance with this invention, the insecticide rotenone is extracted from plants containing it with carbon tetrachloride with the result that a new compound is formed by the chemical combination of these two materials. The new compound is an addition compound and possesses insecticidal properties differing from either rotenone or carbon tetrachloride acting alone. It has highly valuable properties as an insecticide and as a mothproofing agent.

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PROCESS OF PREPARING DIHYDROROTENONE

Patent No. 1,945,312 (D) Patent Date: January 30, 1934

Inventors: Herbert L. J. Haller and Paul S. Schaffer

By means of this invention, dihydrorotenone may be made by hydrogenating rotenone (an insecticide) in the presence of a nickel catalyst.

Pure rotenone need not be used. A suitable extract of a plant containing rotenone may be employed, such as tuba root and cube root.

The hydrogenation may be carried out at room temperature and at atmospheric pressure.

An organic solvent that does not react with the catalyst should be used, such as benzene, acetone, ethyl acetate, and butyl acetate.

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FUNGICIDE

Patent No. 1,958,102 (D) Patent Date: May 8, 1934
Inventor: Marion C. Goldsworthy

A mixture of cupric oxide and lime is indicated as having superior fungicidal action without being deliterious to plants.

Tests are mentioned against organisms causing brown rot of apples and peaches, apple scab, peach scab and apple bitter rot.

See also Patent No. 1,954,171 (D), issued April 10, 1934, entitled Fungicide (same inventor) covering a mixture of copper phosphate and lime.

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MACHINE AND METHOD FOR DETECTING PINK BOLLWORM IN COTTON SEED

Patent No. 2,002,745 (D) Patent Date: May 28, 1935
Inventor: Robert E. McDonald

This invention provides an apparatus for detecting pink bollworm in cotton seed. It can handle about 384,000 seeds per day as compared to 4800 seeds per day by the pocket knife method.

Essentially, it comprises two oppositely rotating drums having pins or spikes projecting from the surface. The cylinders are so spaced that the pins on one drum come within about 1/16 of an inch from those on the other drum. A hopper feeds the seeds between the drums and each seed is pierced by the pins on the drums, as it passes through. The drums are in an electrical circuit, and, if a bollworm is in the seed, the circuit is completed through it which is indicated to the operator by a light, whereupon the machine is stopped and the seed removed.

See also Patent No. 1,937,315 (D), issued November 28, 1933 (Robert E. McDonald and Gustav J. Scholl, inventors), entitled Machine for the Purpose of Detecting Pink Boll Worm Infestation in Gin Trash.

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SPRAY MATERIAL

Patent No. 2,004,788 (D) Patent Date: June 11, 1935
Inventor: Edmund L. Green

This invention utilizes a modified bentonite as an adhesive or adjuvant for plant spray mixtures.

The natural water-absorbative, jell-forming characteristic of bentonite is changed to a flocculated bentonite that does not swell or disperse in water. This increases its power to attract and hold solid particles of a toxic spray composition.

This flocculated condition is effected by adding quicklime or its equivalent in the form of hydrated lime to a suspension of about one part of bentonite to 100 parts of water.

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ACTIVE OR TOXIC SPRAY MATERIAL

Patent No. 2,004,789 (D) Patent Date: June 11, 1935
Inventor: Edmund L.Green

This patent covers the combination of copper silicate and lime as a plant spray to combat harmful microorganisms. It is indicated as being less likely to injure plants than Bordeaux mixture (copper sulphate and slaked quick lime) due to the greater insolubility of the copper compound.

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FUMIGANT

Patent No. 2,024,027 (D) Patent Date: December 10, 1935
Inventors: Richard T. Cotton and Harry D. Young

This patent teaches that the addition of carbon dioxide to fumigants, such as chloropicrin, ethylene oxide, carbon disulfide, ethylene dichloride, carbon tetrachloride, methyl chloroacetate, and other fumigants, reduces the required length of exposure, as well as the amount of fumigant, necessary to kill insects.

This action follows from the fact that when the carbon dioxide content of the air is increased to certain concentrations, the rate of metabolism of exposed insects is greatly increased which renders them more susceptible to the action of the fumigants.

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SPRAY MATERIAL

Patent No. 2,037,658 (D) Patent Date: April 14, 1936
Inventor: John W. Roberts

This patent covers a plant spray material comprising zinc nitrate and lime for combatting parasitic organisms. The disclosure refers to Patent No. 1,791,430 (D), covering a mixture of zinc sulphate and lime.

See also companion Patent Nos. 2,037,657 (D) for adding zinc-lime to arsenical sprays to prevent plant injury, and Patent No. 2,037,656 (D) covering the complex products of reaction between zinc-lime and lime-sulphur as a parasiticidal preparation.

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INSECTICIDE

Patent No. 2,049,725 (D) Patent Date: August 4, 1936
Inventor: Lloyd E. Smith

Diaryl thioxins, particularly phenothioxin, are indicated as having insecticidal action.

Results of tests are given against mosquito larvae, codling moth and house flies.

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PROCESS OF PREPARING PURIFIED PYRETHRIN CONCENTRATE
Patent No. 2,050,974 (D) Patent Date: August 11, 1936
Inventors: Frederick B. LaForge and Herbert L. J. Haller

Pyrethrin is an active insecticidal principle used in many insecticidal compositions. It is obtained from pyrethrum flowers by extraction with organic solvents. Previous methods for effecting this extraction failed to remove large quantities of fats, waxes, fatty acids, and coloring matter. These inactive materials not only contaminate the final composition, but cause staining of fabrics and needlessly add to the shipping weight thereof.

By the process of this invention, a pyrethrin concentrate may be prepared that is partially free of the fatty acids and practically free of the fats, waxes and coloring matter.

In accordance with the process, an extraction is first made of the pyrethrum flowers with a suitable volatile solvent in the usual manner, thus obtaining oleoresin of pyrethrum flowers. Then acetic acid, containing a small amount of water, is added to the oleoresin. This precipitates the fats and waxes and, to a certain extent, the fatty acids, leaving the pyrethrins dissolved in the acetic acid. Filtration is accomplished at a low temperature (about 0^{o} C.) where the precipitated materials are changed from a semi-solid to a solid consistency. The filtrate is partially decolorized with carbon and subsequently diluted with water to permit separation of the acetic acid from the oleoresin. By collecting the oleoresin in a light petroleum distillate, most of the remaining coloring matter is left behind.

The concentrate prepared by this method may be further purified in accordance with the procedure described in Patent No. 2,044,502 (A), issued June 16, 1936, to same inventors, entitled Process for the Purification of Pyrethrin Concentrates. In accordance with this subsequent process, the concentrate is dissolved in aniline oil and a concentrated aqueous solution of potassium carbonate added. These two solutions do not mix well and are agitated together for several hours at a temperature of about -10^{o} C. to prevent saponification of the pyrethrins. This operation results in the neutralization of the fatty acid impurities. The resulting soaps will be contained in the aqueous solution which is separated from the aniline solution containing the pyrethrins. The pyrethrins are then separated from the aniline by solvents.

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DOUBLE SALT OF COPPER ARSENITE AND A COPPER SALT OF AN UNSATURATED FATTY ACID AND PROCESS OF MAKING THE SAME
Patent No. 2,080,004 (D) Patent Date: May 11, 1937
Inventor: Frederick Dearborn

This patent covers new compounds of the general formula $3CuAs_2O_4 \cdot CuOR$ in which R is the anhydride of a monocarboxylic acid of the general formula $C_nH_{2n-2}O_2$, such as crotonic, oleic, and eruric acids.

These compounds are indicated as having insecticidal and fungicidal properties and are prepared by reacting a solution of an inorganic copper salt, such as copper sulphate, copper chloride, or copper nitrate, an alkali metal arsenite, such as sodium or potassium arsenite, and an alkali metal salt of a monocarboxylic acid, such as may be obtained by saponifying a vegetable, animal, or fish oil or fat.

See also Patent No. 2,104,584 (D), issued January 4, 1938, entitled Double Salts of Copper Arsenite and a Copper Salt of a Higher Unsaturated Fatty Acid (same inventor) wherein R in the above formula represents the anhydride of a fatty acid, such as linoleic, linolenic, and eleostearic acids.

See also Patent No. 2,159,585 (D), entitled Compounds of Copper, Arsenic and a Sulphmonocarboxylic Acid and Process of Making Them, wherein sulphur is introduced into the molecule at the double bonds.

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INSECTICIDE

Patent No. 2,094,831 (D) Patent Date: October 5, 1937

Inventors: Donald L. Vivian and Herbert L. J. Haller

This invention provides as insecticides compounds having two homocyclic nuclei joined by an azo (- N = N -) linkage which contain one hydroxyl group, one or more nitro groups, and one or more groups such as halogen, aryl, alkyl, aralkyl and hydrogen.

Particular compounds mentioned are 4-(p-nitrophenylazo)-resorcinol and 1-(p-nitrophenylazo)-2-naphthol, which are shown to be effective against culicine mosquito larvae.

This is one of a series of patents on insecticidal compounds of this class. Other patents of this series are Nos. 2,095,939 (D); 2,095,940 (D); 2,095,941 (D); and 2,096,414 (D), all of which issued on October 12, 1937. These patents collectively cover the compounds of the class referred to. Specific compounds mentioned in examples showing toxicity are as follows:

4-(p-bromophenylazo)-resorcinol
4-(2,5-dichlorophenylazo)-phenol
p-iodoazobenzene
4-(p-bromophenylazo)-o-cresol
4-(2,5-dichlorophenylazo)-o-cresol
4-(p-bromophenylazo)-m-cresol
1-(o-tolylazo)-2-naphthylamine
4-(o-tolylazo)-o-toluidine.

Related patents are No. 2,110,896 (D), dated March 15, 1938, covering compounds of the formula

$$CH_3 - R - N = N - R_2 - OH$$

R being a benzene ring interchangeable with R_2, a naphthyl nucleus, examples being 1-(o-tolylazo)-2-naphthol and 4-(o-tolylazo)-1-naphthol; No. 2,110,897 (D), dated March 15, 1938, covering compounds of the formula

$$R - N = N - R_1 - (OH)$$

R being a benzene ring interchangeable with R_1, a naphthyl nucleus, examples being 4-phenylazo-1-naphthol, (1-naphthylazo)-phenol, and 4-(2-naphthylazo)-1-naphthol; and No. 2,111,879 (D), dated March 22, 1938, covering compounds of the formula

$$R_1 - N = N - R_2 - (NH_2),$$

R_1 and R_2 being the same as above and examples being 1-phenylazo-2-naphthylamine, p-(1-naphthylazo)-aniline, and 1-(1-naphthylazo)-2-naphthylamine.

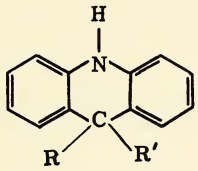
COMPOUND AND PROCESS FOR MAKING SAME
Patent No. 2,096,566 (D) Patent Date: October 19, 1937
Inventor: Claude R. Smith

The invention provides a stomach poison for insects which is essentially the reaction product of neutralized nicotine and bentonite.

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INSECTICIDE
Patent No. 2,099,826 (D) Patent Date: November 23, 1937
Inventors: Paul S. Schaffer and Herbert L. J. Haller

This invention provides insecticidal compounds known as dialkyl acridans and their derivatives. The structural formula for such compounds is



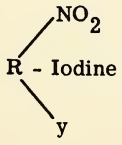
where R and R′ are alkyl radicals of the general formula $C_nH_{2n} + 1$

Dimethylacridan is given as a specific compound and its insecticidal activity is shown against mosquito larvae, cross-striped cabbage worm, cabbage webworm, and cabbage looper.

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INSECTICIDE
Patent No. 2,100,493 (D) Patent Date: November 30, 1937
Inventors: Lloyd E. Smith and Houston V. Claborn

Compounds of the following formula are indicated as having insecticidal activity:



where R is an aromatic nucleus and y is hydrogen, an alkyl group, iodine, or a nitro group.

Specific compounds mentioned are p-nitroiodobenzene, o-nitroiodobenzene and m-nitroiodobenzene.

Specific insects mentioned are codling moth larvae, silkworms and tent caterpillars.

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INSECTICIDE AND FUNGICIDE

Patent No. 2,101,645 (D) Patent Date: December 7, 1937

Inventors: Robert A. Fulton and Willis Coward Fernelius

Sulfur nitride is indicated as being effective in killing the larvae of the Mexican bean beetle. It is also effective in retarding the growth of common air spores, such as blue and red mold, at a dilution of 1 to 10,000.

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INSECTICIDE

Patent No. 2,103,195 (D) Patent Date: December 21, 1937

Inventor: Howard A. Jones

This invention provides as a new chemical compound the molecular combination of rotenone and dichloroacetic acid in a 1 to 1 molal ratio. The combination takes place by fusion or addition.

The new compound is indicated as having insecticidal properties.

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ADHESIVE

Patent No. 2,104,491 (D) Patent Date: January 4, 1938

Inventor: Robert S. McKinney

Alpha-eleostearic acid, the principal acid derived from tung oil, is indicated as being sticky and as exhibiting water-resistant properties when spread out in thin layers and exposed to heat and sunlight. In these properties, it is suggested for use as an adhesive in combination with insecticides and fungicides.

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PROCESS FOR MAKING AN INSECTICIDE

Patent No. 2,107,058 (D) Patent Date: February 1, 1938

Inventor: Louis N. Markwood

This invention provides a method of making a nicotine insecticide which is in a solid form and which is practically water-insoluble. This is advantageous in that it is not easily washed off by rain and hence remains effective over long periods on plants to which it is applied.

In accordance with the invention, nicotine is reacted with peat. The nicotine may be either in aqueous solution or in the vapor state with or without steam.

The peat is preferably pretreated with a mineral acid or acetic acid to increase the percentage of nicotine combining with the peat. Treatment of the peat with a fixed alkali is also recommended prior to the acid treatment.

The resulting nicotine-peat is a chemical reaction product that is water-insoluble.

See related patent No. 2,066,941 (D), issued January 5, 1937, wherein nicotine is combined with humic acid to form nicotine humate, which is insecticidal.

Humic acid is derived from natural materials, such as peat, lignite, and sugar. Also, nicotine humate is a by-product of the nicotine peat reaction. It is water soluble and is indicated as being preferable to nicotine sulphate in commercial handling and application while possessing equivalent insecticidal activity.

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INSECTICIDE

Patent No. 2,110,614 (D) Patent Date: March 8, 1938

Inventors: Donald L. Vivian and Herbert L. J. Haller

This invention provides as insecticidal agents, organic compounds containing a heterocyclic ring of 4 carbon and 2 nitrogen atoms, the latter being in the 1,4 position.

Suitable compounds are phenazine, naphthazines and various derivatives including those in which substituents are attached directly to nitrogen, such as dihydrophenazine, induline, etc.

Other specific compounds mentioned are 2-aminophenazine, 2,3-diaminophenazine, dibenzoparadiazine, and pyrazine.

Specific insect mentioned is codling moth larvae.

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SPRAY MATERIAL

Patent No. 2,113,625 (D) Patent Date: April 12, 1938

Inventor: John Monteith, Jr.

This invention provides a spray composition for enhancing the appearance of foliage and may be used on golf and bowling greens and other fine turf to maintain the appearance of a natural, healthy color throughout unfavorable weather or at times when injuries occur.

The composition also has the property of preventing or inhibiting the growth and spread of fungus diseases, such as brownpatch, dollarspot and spotblight of turf.

The composition as claimed comprises 5 ounces Malachite green; 5 ounces of Aucamine O; 1/10 ounce crystal violet; and approximately 50 gallons of water.

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INSECTICIDE

Patent No. 2,115,046 (D) Patent Date: April 26, 1938

Inventor: Lloyd E. Smith

Nitrated tolyl ethers are indicated as having insecticidal activity.

Specific compounds mentioned are 4,6-dinitro-o-tolyl methyl ether; 4,6-dinitro-o-tolyl phenyl ether; and 4,6-dinitro-o-tolyl ethyl ether.

Specific insects mentioned are mosquito larvae and codling moth larvae.

SPRAY NOZZLE

Patent No. 2,115,442 (D) Patent Date: April 26, 1938
Inventor: Walter T. Emery

By means of this invention, the exhaust gases of a gasoline or other petroleum engine can be used to spread a liquid insecticide or other agent in a mist or spray.

The invention is a nozzle that can be attached to one end of a hose, while the other end is attached to the exhaust pipe of the engine. The nozzle is provided with an expansion and a recompression chamber from which the gas is exhausted through slits of a long, narrow grill. These slits are in communication with openings in another pipe that is connected to a source of the liquid material to be sprayed.

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NEEDLE NOZZLE

Patent No. 2,116,591 (D) Patent Date: May 10,1938
Inventor: George W. Barber

This invention provides a hand tool for injecting into the internal silks of growing ears of corn an insecticide for combatting the corn earworm or other insects which feed within such plant parts.

Essentially, the invention is a long nozzle that terminates in a hypodermic needle. The liquid insecticide is introduced into the nozzle at the other end under pressure. A hand-operated valve is provided between this point and the hypodermic needle. By these means, the needle can be inserted through the husks of the corn ears, and any desired amount of insecticide can be introduced into the ear.

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INSECTICIDE

Patent No. 2,127,090 (D) Patent Date: August 16, 1938
Inventor: Lloyd E. Smith

Dinitrated tolyl esters of organic acids are indicated as having insecticidal properties.

A preferred compound is 4,4-dinitro-o-tolyl acetate which is shown to be toxic against mosquito larvae, codling moth, and tobacco hornworm.

Other compounds specifically mentioned are 4,6-dinitro-o-tolyl benzoate and 4,6-dinitro-o-tolyl-mono-chloracetate.

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INSECTICIDE AND FUNGICIDE

Patent No. 2,127,380 (D) Patent Date: August 16, 1938
Inventor: Frederick E. Dearborn

This invention provides new compounds having insecticidal and fungicidal properties.

These compounds are the complex products of reactions between an alkali metal arsenite, such as sodium arsenite, an inorganic cupric salt,

such as cupric chloride and copper sulfate, and alkali metal salts of vegetable, animal or fish oils or fats, such as coconut, cottonseed, corn and linseed oils, tallow, lard, whale, sperm and menhaden oils, etc.

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INSECTICIDE
Patent No. 2,138,557 (D) Patent Date: November 29, 1938
Inventor: Charles C. Plummer

Copper sucrate is indicated as being an effective insecticide. This compound is green in color and is, therefore, not unsightly when deposited on green foliage. It is also cheap, readily prepared and is attractive to insects.

Specific insects mentioned are Mexican fruit fly and Mediterranean fruit fly.

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INSECTICIDE
Patent No. 2,140,481 (D) Patent Date: December 13, 1938
Inventors: William Gordon Rose and Herbert L. J. Haller

Pentaerythrityl halides and pentaerythrityl halohydrins are indicated as having insecticidal action. These compounds have the formula

$$C(CH_2X)_4 \text{ or } (CH_2X)_{\underline{n}}C(CH\ OH)_{4-\underline{n}}$$

where X is fluorine, chlorine, bromine, or iodine atoms, and n may be 1, 2 or 3.

Specific insects mentioned are cross-striped cabbage worm, southern army worm and cabbage looper.

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ADHESIVE FOR INSECTICIDES
Patent No. 2,146,257 (D) Patent Date: February 7, 1939
Inventor: Lyle D. Goodhue

This invention provides, for use as adhesives for insecticides, the reaction products of furfural with aromatic amines, such as furfural- beta-naphthyl amine, furfural aniline, and furfural-p-toluidine. In effecting the reaction, acceleration catalysts may be used such as iodoform or cupric chloride.

See companion Patent No. 2,146,258 (D) for adhesives that are condensation products of furfural and ketones, such as furfural-acetone, furfural-methyl ethyl ketone, furfural-acetophenone, furfural benzophenone and furfural 2-naphthyl ketone.

See also Patent No. 2,129,517 (D) (same inventor), issued on September 6, 1938, entitled Adhesive for Insecticides and a Process for Making Same.

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INSECTICIDE

Patent No. 2,147,947 (D) Patent Date: February 21, 1939
Inventor: Valdemar A. Johnson

This invention teaches that a mixture of hydrocyanic acid and methyl bromide is more effective as a fumigant than either of these ingredients alone. Synergistic action is thus indicated. Proportions recommended are: 1 ounce of hydrocyanic acid to 1/2 pound methyl bromide.

Results of tests against the Japanese beetle are given.

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INSECTICIDAL AND FUNGICIDAL COMPOSITIONS

Patent No. 2,150,759 (D) Patent Date: March 14, 1939
Inventor: Roscoe H. Carter

This invention provides a single composition that contains both an insecticide and a compatible fungicide.

The insecticide is a cuprous xanthate, such as cuprous methyl xanthate, cuprous propyl xanthate, and cuprous amyl xanthate. The fungicide is a lower di alkyl xanthogen, such as the dimethyl, dipropyl and diamyl xanthogens.

These ingredients are combined in the molecular ratio of 2 to 1, respectively.

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INSECTICIDE

Patent No. 2,152,236 (D) Patent Date: March 28, 1939
Inventor: Charles H. Batchelder

This invention provides a method of preparing nicotine tannate in a form (concentrated) in which it can be readily used as an insecticide by diluting it with water or adding it to alkaline fungicides, such as Bordeaux mixture. Cheap grades of tannin may be used.

Essentially the process comprises reacting nicotine and tannin in an aqueous medium in the presence of a protective colloid, such as gum arabic and nontannin constituents of quebracho extract.

The colloid must not be such as to react with either the nicotine or the tannin. It is retained in the final product to facilitate dispersion of the nicotine tannate in water.

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INSECTICIDE

Patent No. 2,155,010 (D) Patent Date: April 18, 1939
Inventor: Andrew F. Freeman

The compound N-nitrosodiphenylamine is indicated as having insecticidal properties.

Particular insects mentioned are imported cabbage worm, striped cabbage worm, and southern army worm.

PROCESS OF TREATING GLYCERIDES

Patent No. 2,169,793 (D) Patent Date: August 15, 1939

Inventor: Frederick E. Dearborn

By heating glycerides of long chain unsaturated fatty acids, such as that obtained from various vegetable, animal and fish oils, including peanut, wood, corn, linseed, cottonseed, sesame and tung oils, with sulfur at a temperature of 135° to 220° C. in the presence of iodine as a catalyst, the sulfur becomes combined by addition at the double bonds.

These compounds are indicated as having insecticidal and fungicidal properties.

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METHOD AND APPARATUS FOR DISPERSING MATERIALS

Patent No. 2,172,001 (D) Patent Date: September 5, 1939

Inventor: Alexander Gordon Galloway

By the use of this invention, an insecticide in dust form can be dispersed from a flying airplane in such a manner that as the dust leaves the airplane, individual droplets of a spray of an oil intercepts the dust particles. Consequently, they fall to the earth together on vegetation and the oil droplets hold the particles of dust on the foliage.

Large insect infested areas can be treated in this way.

Essentially, the device for accomplishing this result consists of a wide tube through the forward end of which air is admitted as the airplane flies. The dust to be dispersed is metered into this tube and becomes entrained in the air passing through it. The rear end of the tube is open, and a cone-shaped device is mounted therein to deflect the dust-entrained air to the outer edge of the tube. This cone is mounted on the end of a hollow rotating shaft through which the oil is forced. A plate is attached to the cone just beyond its base. Oil passing through the hollow shaft impinges on the plate, and, since the plate is rotating, centrifugal force breaks up the oil into small droplets and throws it outward into the stream of dust-entrained air.

The device, obviously, may be used for dispersing dust materials other than insecticides and fungicides.

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COPPER XANTHATE

Patent No. 2,173,383 (D) Patent Date: September 19, 1939

Inventor: Roscoe H. Carter

This invention provides copper xanthates of the mono alkyl ethers of ethylene glycol. The patent covers only the lower alkyl ethers, including specifically the methyl and ethyl ethers. The compounds are made by heating the particular ether selected with a strong alkali, such as potassium hydroxide under a reflux condenser. The resulting mixture is cooled and carbon disulfide added to it. This is again heated to boiling under a reflux condenser. The resulting mixture solidifies on cooling which is dissolved in water and reacted with copper sulfate which yields the desired product.

See also companion Patent No. 2,173,384 (D) (same inventor) entitled Copper Xanthate, covering, generally cuprous xanthates of the lower mono alkyl ethers of diethylene glycol, and specifically, the ethyl and butyl ethers.

HERBICIDE

Patent No. 2,173,236 (D) Patent Date: September 19, 1939
Inventor: Harold R. Offord

This invention provides a composition of matter that is useful in killing weeds and other undesirable plants. It is specifically suitable for killing currants, gooseberries, and barberry plants where they may be found growing in a wild or cultivated state in places such as promenades, alleys, landing fields, along roads and railways, public places, forest areas, and so forth.

The composition consists of furfural that has been saturated with ammonium thiocyanate and then combined with Diesel oil (1 to 20 parts, specific gravity 27° to 32° Baumé).

See also Patent No. 1,913,141 (D) issued June 6, 1933 (Harold R. Offord and George R. Van Atta, inventors), entitled Plant Killer, covering a herbicidal preparation comprising sodium tetrathiosulphatocyanocuprite formed by reacting one part cuprous cyanide and not less than 11 parts sodium thiosulphate.

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INSECTICIDAL FUMIGATION OF GROWING CORN

Patent No. 2,173,293 (D) Patent Date: September 19, 1939
Inventor: George W. Barber

Growing corn is fumigated by inserting through the top of each ear within the internal silks a fumigant, such as hexachlorethane, in the form of a small tablet. That part of the ear above the tablet is then sealed by means of a simple wire device on the order of a safety pin that presses two sides of the husks together and holds them there indefinitely.

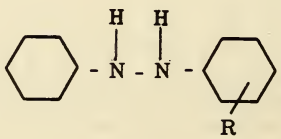
This is an improvement over Patent No. 2,103,607 (D) (same inventor) issued on December 28, 1937, entitled Method of Preventing Caterpillar Injury to Ear Corn.

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INSECTICIDE

Patent No. 2,173,386 (A) Patent Date: September 19, 1939
Inventor: Donald L.Vivian

Compounds of the following formula are indicated as having insecticidal action:



where R is either hydrogen, alkyl, alkoxy, aryl, aralkyl, amino, acetamido, nitro, or halogen.

One of the preferred compounds is hydrazobenzene which is indicated as being effective against the southern army worm, the cross-striped cabbage worm, the melon worm, and others, including the codling moth.

INSECTICIDE

Patent No. 2,175,109 (D) Patent Date: October 3, 1939
Inventors: Houston V. Claborn and Lloyd E. Smith

Compounds of the following general formula are indicated as having insecticidal action:

where R and R′ are aromatic nuclei in which two adjacent carbon atoms take part in forming a 5-membered carbon ring, and R_2 is either 2 hydrogen atoms, or oxygen, or one hydrogen and one hydroxyl group. Other derivatives are indicated. The only specific compound covered by the patent is 9-chlorofluorene. This is shown to be toxic against the codling moth and mosquito larvae. 2-Fluoryl amine is shown to be toxic against mosquito larvae.

Other specific compounds mentioned are fluorene, 9,9-dichlorofluorene, 9-fluorenol, 2-fluorenol, 2-nitro-9-fluorenol, and 9-fluorenol acetate.

See also Patent No. 2,197,249 (A) (same inventors) covering other derivatives of the same compound.

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FUNGICIDE

Patent No. 2,177,198 (D) Patent Date: October 24, 1939
Inventor: Marion C. Goldsworthy

This patent teaches the use of phenothiazone as a fungicide.

It is indicated as being toxic to organisms causing brown rot of apples, peaches and other stone fruits, and apple bitter rot.

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FLY TRAP

Patent No. 2,181,595 (D) Patent Date: November 28, 1939
Inventor: Wesley Gordon Bruce

This device can be built on the farm. It is essentially a structure built in the form of a long corridor through which cows, horses, and other livestock can be made to pass. The walls of the structure are made of screens. Each wall has a flat exterior screen and an interior zigzag screen. The interior walls have openings to permit flies to enter between the two screens with little likelihood of their getting out. As the animal walks down the corridor, hanging curtains brush the flies off his body. The flies leaving the animal will, by nature, go to the point of greatest light, which is the screen walls. They fly against the screens, go through the openings, and are trapped.

The structure can be built anywhere on the farm where livestock are likely to be. For example, it can be used as a passage between fences.

For a moth trap, see Patent No. 2,257,655 (D) (Lincoln B. Scott and Joe Milam, inventors), issued September 30, 1941, entitled Insect Trap.

For Japanese beetle traps, see Patents Nos. 1,968,953 (D) and 1,968,954 (D) (Frederick W. Metzger, inventor), both issued on August 7, 1934, and Patent No. 2,020,283 (A) (Donald E. Armstrong and Frederick W. Metzger, inventors), issued on November 12, 1935, entitled Insect Trap.

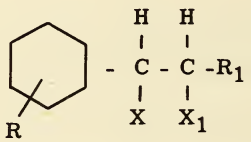
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INSECTICIDE

Patent No. 2,189,570 (D) Patent Date: February 6, 1940

Inventors: Milton S. Schechter and Herbert L. J. Haller

Compounds of the following type are indicated as having insecticidal action:



where X and X_1 are halogen atoms and R and R_1 are each a hydrogen, a nitro group, or an alkyl group.

A preferred compound is alpha, beta-dibromoethylbenzene, or styrene dibromide which gave good results against mosquito larvae, cross-striped cabbage worms, and southern army worms.

Another preferred compound of this type is alpha, beta-dibromo-beta-nitroethylbenzene, also known as omega-nitrostyrene-dibromide, which gave good results against the cross-striped cabbage worm and the southern army worm.

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INSECTICIDE

Patent No. 2,191,299 (A) Patent Date: February 20, 1940

Inventor: Lloyd E. Smith

Compounds of the class known as iodoxy-benzenes and nitro derivatives thereof are indicated as having insecticidal properties.

Results of tests of iodoxy-benzene are given against the southern army worm, the cross-striped cabbage worm, and the imported cabbage worm.

p-Iodoxynitrobenzene is shown to be effective against the tobacco hornworm, codling moth larvae, and southern army worm. The ortho and meta forms of this derivative are also mentioned specifically.

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INSECTICIDE

Patent No. 2,191,300 (A) Patent Date: February 20, 1940

Inventor: Lloyd E. Smith

Compounds known as iodosobenzenes and their nitro derivatives are indicated as having insecticidal action.

Results of tests are given of (1) iodosobenzene against screw worm

larvae; (2) o-iodosonitrobenzene against the Colorado potato beetle, southern army worm, the diamondback cabbage worm, southern webworm, and the Hawaiian beet webworm; and (3) p-iodosonitrobenzene against codling moth larvae. The meta form is also mentioned specifically.

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INSECTICIDE

Patent No. 2,191,301 (A) Patent Date: February 20, 1940
Inventor: Lloyd E. Smith

Compounds known as phenyl iodochlorides and their nitro derivatives are indicated as having insecticidal properties.

Results of tests are shown as follows:

1. m-Nitrophenyliodochloride against Colorado potato beetle, southern army worm, Hawaiian beet webworm, melon worm, and southern beet webworm.

2. p-Nitrophenyliodochloride against melon worm larvae, tobacco hornworm larvae, and codling moth larvae.

3. Orthophenyliodochloride against Colorado potato beetle larvae, southern army worm larvae and diamond back cabbage worm.

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MACHINE FOR THE PURPOSE OF DESTROYING THE PINK BOLLWORM IN COTTONSEED

Patent No. 2,191,893 (D) Patent Date: February 27, 1940
Inventors: Robert E. McDonald and Gustav J. Scholl

Pink bollworm, a very destructive insect of cotton, has a habit of concealing itself in cottonseed where it may live a long time and be carried with the seed as an article of commerce to different localities where it begins other infestations.

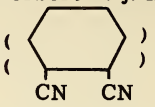
This invention provides a device for rendering cottonseed free from living pink bollworms, thereby making it a safe article of commerce.

These insects are killed at a temperature of 150° F. At this temperature cottonseed is not injured. Accordingly, the invention is a device for heating cottonseed to this temperature. The device consists of a trough in which a flight conveyor screw is operated to feed the cottonseed from one end to the other. Around the central portion of the trough, there is disposed a housing suitable for holding water in the space between it and the trough. This water is kept boiling by burners underneath. This saturates the atmosphere in the trough with hot water vapors which contact the seed as it is carried through by the conveyor screw. The volume of seed passing through is controlled so that it is subjected to temperatures of about 150° F.

INSECTICIDE

Patent No. 2,200,564 (A) Patent Date: May 14, 1940

Inventors: Milton S. Schechter and Herbert L. J. Haller

The compound phthalonitrile  is shown to be toxic to

the southern beet webworm, the Hawaiian beet webworm, the diamond-back cabbage worm, southern army worm, Colorado potato beetle, yellow bear, celery leaf tier, codling moth larvae, and the screw worm.

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INSECTICIDE AND FUNGICIDE

Patent No. 2,201,103 (D) Patent Date: May 14, 1940

Inventor: Frederick E. Dearborn

New compounds having utility as insecticides and fungicides are provided having the general formula $3CuAs_2O_4.CuORS_x$, in which RS_x is the anhydride of a sulfurized unsaturated monocarboxylic acid containing from 1 to 4 atoms of sulfur in the acid molecule. The acids are of the series $C_nH_{2n-2}O_2$, $C_nH_{2n-4}O_2$, $C_nH_{2n-6}O_2$, and $C_nH_{2n-8}O_2$.

These compounds are the complex products of the reaction between a solution of an alkali metal arsenite, an inorganic cupric salt, and alkali metal salts of sulfurized oils (vegetable, animal, or fish oils) containing glycerides of unsaturated monocarboxylic acids of the type mentioned.

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OIL SYNERGIST FOR INSECTICIDES

Patent No. 2,202,145 (D) Patent Date: May 28, 1940

Inventor: Craig Eagleson

The inventor found that when sesame oil is combined with insect toxins, such as pyrethrins and rotenone, the insecticidal effect is greatly increased. Sesame oil alone is not toxic to flies, but when added in amounts from 0.5 to 20% by volume to various insecticides, it increases the insecticidal action. Manifestations of this kind are known as "synergisms."

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FUNGICIDE

Patent No. 2,203,431 (D) Patent Date: June 4, 1940

Inventor: Marion C. Goldsworthy

The compound 2.4 diamino-diphenylamine is indicated as having fungicidal properties without being deleterious to plants.

Results of tests are given against spores of organisms causing brown rot of peaches and other stone fruits, apple bitter rot, peach scab, apple scab, and cherry leaf spot.

INSECTICIDE

Patent No. 2,217,566 (D) Patent Date: October 8, 1940
Inventor: Lloyd E. Smith

The invention relates to the use of phenthiazine and related compounds as insecticides. The results of tests shown it to be more effective in water solutions than rotenone in all concentrations up to 1 part in 2,000,000 against mosquito larvae. Results of other tests show that it is nontoxic to foliage in concentrations of 2 parts per 50 gallons of water.

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HERBICIDE

Patent No. 2,218,787 (D) Patent Date: October 22, 1940
Inventors: Thomas F. Catchings, Lamar J. Padget, and Lynn H. Dawsey

Sodium arsenite is widely used as a weed killer, but it is objectionable in the fact that it is poisonous to livestock and exerts a conosine action upon the skin of workmen handling it. The usual concentration used is about 0.5 to 10%.

This invention provides a herbicide composition that contains sodium arsenite in much smaller concentrations (1/10 of 1% by wgt.), thereby reducing toxic dangers to warm-blooded animals, but at the same time maintaining its effective action as a herbicide in comparison to usual compositions containing greater percentages.

The composition of this invention, in addition to the sodium arsenite, contains an oil, such as Diesel oil, Industrial Medium Fuel oil, or the Bunker "C" oils, and a wetting agent, such as sodium oleate, potassium fish oil soap, sodium and ammonium caseinates, gum arabic, and sodium lauryl sulfate. A preferred wetting agent is the reaction product of caustic soda and Tallöl (a by-product of the Kraft paper industry, also known as Tall oil). The oil and wetting agent have little or no herbicidal action in themselves, but increase the herbicidal effect of the sodium arsenite, thereby permitting smaller concentrations of the latter to be used. A specific composition is as follows:

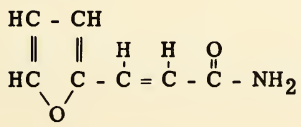
Water	88 gals.
Caustic soda	1 lb.
40% sodium arsenite solution	1 gal.
Tallöl	5 lbs.
Oil	10 gals.

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INSECTICIDE

Patent No. 2,224,243 (A) Patent Date: December 10, 1940
Inventor: Charles Verne Bowen

This invention provides the compound 2-furan acrylamide as an insecticide. It has the following formula:

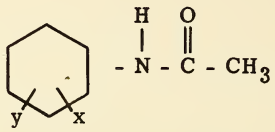


Results of tests are given against melon worms, southern army worm, imported cabbage worm, and screw worm larvae.

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INSECTICIDE
Patent No. 2,226,672 (D) Patent Date: December 31, 1940
Inventor: Lloyd E. Smith

This patent teaches the insecticidal use of compounds of the general formula



where x is halogen and y represents alkyl, aryl, hydroaryl, nitro, amino or a halogen group. Specific compounds mentioned are p-bromoacetanilide, p-chloroacetanilide, and p-iodoacetanilide.

Results of tests are given against southern army worm, cross-striped cabbage worm, and Noropsis hieroglyphia.

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INSECTICIDE
Patent No. 2,239,832 (A) Patent Date: April 29, 1941
Inventor: Lloyd E. Smith

The three isomeric aminoacetanilides are indicated as being effective in killing many species of insects.

Results of tests are given of p-aminoacetanilide against the southern army worm, melon worm, bean leaf roller, cabbage looper, cross-striped cabbage worm, and imported cabbage worm.

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PROCESS OF RENDERING FABRIC RESISTANT TO FUNGAL AND BACTERIAL ATTACK
Patent No. 2,247,339 (D) Patent Date: June 24, 1941
Inventor: Helen M. Robinson

The invention is useful in the treatment of fabrics, such as awnings, sails, tents, tarpaulins, and similar fabrics that are normally exposed to moisture and hence to attack by fungi and bacteria which weaken them.

The treatments involve immersion of the fabric in an inorganic salt solution, such as copper sulphate or cadmium sulphate, followed by immersion in morpholine. This forms a precipitate in the fibers of the material which is a fungi- and bacteria-resisting agent. The treated material retains its durability and is odorless.

It is indicated that copper chloride and cadmium chloride may be substituted for the corresponding sulphates.

METHOD FOR THE CONTROL OF JAPANESE BEETLE

Patent No. 2,258,319 (A) Patent Date: October 7, 1941

Inventor: Samson R. Dutky

This patent teaches a method for controlling larvae forms of certain insects, particularly of the Japanese beetle by disseminating in the soil the resistant stages of the bacteria Bacillus popilliae, Bacillus lentimorbus and related forms. (See Patent No. 2,293,890 (A), p. 47 for propagation method.) This produces a fatal condition in the larvae known as milky disease.

The bacteria can be prepared for commercial sale in the form of a dry powder.

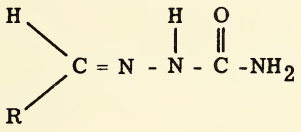
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INSECTICIDE

Patent No. 2,261,735 (A) Patent Date: November 4, 1941

Inventors: Samuel I. Gertler and Herbert L. J. Haller

This patent covers compounds of the semi-carbazone class as insecticides, having the general formula



where R is an alkyl, aryl, or heterocyclic radical having one or more of the substituents nitro, halogen, amino, and hydroxy.

Specific compounds covered are crotonaldehyde semicarbazone, 2-furaldehyde semicarbazone, and salicylaldehyde semicarbazone.

Tests are reported against screwworm larvae (jar test), Hawaiian beet webworm and larvae, melon worm, and imported cabbage worm.

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INSECT LARVAE LURE

Patent No. 2,263,827 (A) Patent Date: November 25, 1941

Inventor: Edouard H. Siegler

Many materials used to control insect larvae on growing fruit and foliage, such as lead arsenate, calcium arsenate, tartar emetic, phenothiazine, and others, are not palatable to the larvae. For this reason, the insect larvae will seek unpoisoned areas of the host plant for feeding purposes and thus avoid the effect of the poison.

To overcome this situation, this invention provides certain materials which can be mixed with the poison to lure the larvae to it for feeding purposes.

Specific lure material for this purpose is brown sugar, which, when mixed with various toxic substances, increases their effectiveness against codling moth larvae.

Other materials suitable are sucrose, honey, corn syrup, sorbitol, molasses, and so forth. The claims cover sorbitol only.

INSECTICIDE AND FUNGICIDE

Patent No. 2,269,891 (A) Patent Date: January 13, 1942

Inventors: Charles Verne Bowen and Frederick E. Dearborn

Copper benzoyl lacto-arsenite, a homolog of Paris green, is indicated as being effective both as an insecticide and as a fungicide.

Tests are shown against 5th instar melon worm, 5th instar Hawaiian beet webworm, 4th instar southern beet webworm, 4th instar southern army worm, 2nd instar yellow bear, 5th instar celery leaf tier, 4th instar diamond-back cabbage worm, codling moth larvae, and Sclerotinia Fructicola (brown peach rot).

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INSECTICIDE AND FUNGICIDE

Patent No. 2,269,892 (A) Patent Date: January 13, 1942

Inventor: Roscoe H. Carter

This invention covers the use of heavy metal salts of the di-thiocarbamic acid of morpholine as insecticides and fungicides. Some of the specific compounds mentioned are the zinc, cupric, mercuric, and ferric salts. These salts may be prepared by treating morpholine with carbon disulfide to form the di-thiocarbamic acid of morpholine and then treating a solution of the latter or of its salts with a solution of a heavy metal salt, such as ferric chloride, zinc chloride, mercuric chloride, cupric sulphate, arsenious chloride and so forth.

The copper, iron, mercury and zinc salts are indicated as being particularly effective against peach brown rot and apple bitter rot.

Results of tests of the zinc and iron salts are given against imported cabbage worm and Hawaiian beet webworm and of the iron and mercury salts against the screw worm.

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INSECTICIDE

Patent No. 2,269,893 (A) Patent Date: January 13, 1942

Inventor: Roscoe H. Carter

This invention provides the morpholine salt of the di-thiocarbamic acid of morpholine as an insecticide. Results of tests against the screw worm are given.

The salt may be prepared by treating 1 or 2 mols of morpholine with 1 mol of carbon disulfide. It may also be formed by treating 1 mol of morpholine with 1 mol of sodium hydroxide in aqueous solution and 1 mol of carbon disulfide, and then acidifying the reaction mixture with HCl. The morpholine salt of di-thiocarbamic acid of morpholine precipitates out as a white insoluble compound.

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COMPOSITION OF MATTER FOR USE AS AN INSECTICIDE

Patent No. 2,271,350 (D) Patent Date: January 27, 1942

Inventors: Lloyd E. Smith and Herbert L. J. Haller

Rotenone, a well-known insecticide, is quite insoluble in both hydrocarbon oils and water. Consequently, when it is added to oil and water insecticide spray emulsions, continuous agitation is necessary to prevent its precipitation.

This invention overcomes this difficulty by providing a method of getting greater percentages of rotenone into solution with petroleum spray oils (up to about 0.3%). The rotenone in a substantially pure form is heated in an open vessel with a fatty oil of the type that is soluble in the petroleum oil. Suitable fatty oils for this purpose for use with kerosene are soybean oil, linseed oil, fish oil, peanut oil, corn oil, palm oil, tung oil, sesame oil, and many others.

A temperature of about 160° to 170° C. is recommended for about 15 minutes. This has the effect of dissolving the rotenone in the fatty oil. This solution, while hot, is then added to the petroleum oil. Any excess of rotenone will precipitate out and may be removed by filtration, decantation, or other suitable means.

In addition to functioning as an intermediate solvent, the fatty oil also has the important effect of retarding penetration of the petroleum oil into the vascular system of plants to which the insecticidal preparation may be applied and holds it directly at the surface of the plant tissue where the most effective attack on the parasites is accomplished.

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INSECT REPELLENT

Patent No. 2,272,044 (A) Patent Date: February 3, 1942

Inventor: Roscoe H. Carter

In accordance with this invention, di-morpholine thiuram disulfide is indicated as an insect repellent. Results of tests against the Japanese beetle are better than acid lead arsenate.

The compound may be made by reacting two mols of morpholine and one mol of carbon disulfide and treating the reaction product with iodine.

See also Patent No. 2,354,940 (A) (Roscoe H. Carter and Marion C. Goldsworthy, inventors), issued August 1, 1944, entitled Fungicide, wherein this same compound is shown to be toxic to spores of organisms causing apple scab, apple bitter rot, peach brown rot, and peach scab.

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INSECTICIDE

Patent No. 2,272,047 (A) Patent Date: February 3, 1942

Inventor: Andrew F. Freeman

The compound 1,4-diphenyl semicarbazide is indicated as an effective insecticide.

Results are given of tests against 6th instar southern army worms, 5th instar southern beet webworms and apple worms according to the Siegler apple plug technique.

METHOD OF APPLYING INSECTICIDES

Patent No. 2,285,950 (D) Patent Date: June 9, 1942

Inventors: William N. Sullivan and Lyle D. Goodhue

This invention provides a new method for applying insecticides, such as rotenone and rotenone resins.

The insecticide is first dissolved in a solvent, such as acetone, alcohol, tetrahydronaphthalene, amyl acetate, kerosene, dibutyl phthalate, anisole and safiole. The solution is then sprayed on a hot surface (300° to 500° C.). This results in the production of a dense smoke or fog which will contain the insecticidal material.

The method is novel in its application to solids that have practically no vapor pressure at room temperature.

The method is recommended in the fumigation of greenhouses, mushroom houses, dwellings, bars, grain elevators, railroad cars and coaches, aeroplanes, automobiles, and other enclosed spaces where it is possible to use a fumigant for the destruction of insect pests.

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INSECTICIDE

Patent No. 2,286,636 (A) Patent Date: June 16, 1942

Inventor: Charles W. Murray

This invention provides an efficient carrier for nicotine in insecticidal compositions and other alkaloids, such as anabasine and coniine.

Nicotine is a volatile material and it is, therefore, difficult to maintain it at suitable concentrations in insecticidal compositions, such as dusts and sprays.

In accordance with this invention, an insecticidal dust may be prepared by mixing finely divided (200 mesh or finer) rubber dust with a quantity (about 10%) of 99% nicotine alkaloid and an equal quantity of an oil, such as mineral oils, kerosene, fuel oil, Diesel oil, and vegetable and animal oils, such as cottonseed, soybean, peanut, whale, and herring oils, or others. The mixture swells somewhat, but not unduly. The rubber dust adsorbs the alkaloid. The oil confers good adhering qualities to the dust.

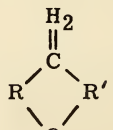
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INSECTICIDE

Patent No. 2,291,192 (A) Patent Date: July 28, 1942

Inventor: Lloyd E. Smith

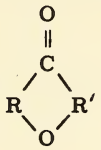
The invention relates to the use of xanthenes and its derivatives as insecticides. The class of compounds is represented by the formula



in which R and R′ are benzene nuclei in each of which two adjacent carbon atoms take part in forming a six membered ring. Some of the hydrogen atoms normally attached to R and R′ may be substituted or replaced by alkyl, cycloalkyl, aryl, heterocyclic nuclei, or halogen, nitro, amino, hydroxy, alkoxy or aryloxy groups.

Good results are indicated against mosquito larvae.

See also companion Patents Nos. 2,291,193 (A) and 2,291,194 (A), issued on the same day to same inventor covering xanthones,



and xanthydrols,



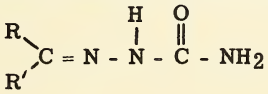
respectively, R and R′ having the same definition. Results of tests against mosquito larvae, southern army worm and tobacco horn worm are given.

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INSECTICIDE

Patent No. 2,292,756 (A) Patent Date: August 11, 1942
Inventor: Herbert L. J. Haller

The insecticides covered are semicarbazones having the formula



where R and R′ are alkyl radicals of the general formula C_nH_{2n+1} Specific examples are acetone semicarbazone, 2,6-dimethyl-4-heptanone semicarbazone, and 2-octanone semicarbazone.

Results of tests are given against southern beet webworm, melon worm, and screwworm larvae.

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PROCESS FOR PROPAGATING BACTERIA

Patent No. 2,293,890 (A) Patent Date: August 25, 1942
Inventor: Samson R. Dutky

The invention is a method for propagating varieties of milky disease for use in the control of the Japanese beetle. The claims cover specifically Bacillus popilliae and Bacillus lentimorbus.

The invention is practiced by injecting living larvae of insects of the family Scarabaeidae, order Coleoptera with Bacillus popilliae or Bacillus lentimorbus and holding the injected larvae at a temperature of from 16° to 30° C. (specific example, 30° C.) for 4 days to 1 month (specific example, 10 to 12 days). At the end of this period, the blood of the living insect larvae swarms with the resistant stages of the bacteria.

These bacteria are useful in the control of the Japanese beetle. (See Patent No. 2,258,319 (A) p. 43)

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INSECT LURE

Patent No. 2,307,844 (D) Patent Date: January 12, 1943
Inventor: Miyauooto McPhail

The invention is a lure for the melonfly (Dacus cucurbitae).

Effective compounds for this purpose are linseed oil soap and corn oil soap. The lure has the advantage that it attracts both sexes of the insect, unlike some other lures which are favored principally by one or the other sex.

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DUSTER FOR INSECTICIDES

Patent No. 2,316,932 (D) Patent Date: April 20, 1943
Inventor: Wesley Gordon Bruce

This is a structure that can be built on farms for the purpose of dusting animals with insecticides. It is big enough to permit the animal, such as a cow, to enter at one end and leave at the other. In passing through the structure, the animal trips a mechanism that releases the insecticide which falls on the animal.

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MOTHPROOFING COMPOSITION

Patent No. 2,318,201 (A) Patent Date: May 4, 1943
Inventors: Wallace Colman and Herbert L. J. Haller

Fabrics and fibers are rendered resistant to fabric pests, such as clothes moths, carpet beetles, and the like, by applying to them, such as by spraying or immersion, isonitrosoacetanilide dissolved in acetone. This compound may be used alone, but it is preferred that other compounds be added to fix it in the fiber or fabric. Preferable fixing agents are benzoic acid, phthalic acid, salicylic acid, benzamide, p-toluene sulfonyl chloride, and p-toluene sulfonyl-N-butylamide.

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METHOD OF APPLYING PARASITICIDES

Patent No. 2,321,023 (A) Patent Date: June 8, 1943
Inventors: Lyle D. Goodhue and William N. Sullivan

The invention is broadly directed to a method of producing a fine suspension of solid matter, such as an insecticide, in the air. Such a suspension is known as an "aerosol."

The method requires that the material to be suspended be first dissolved in a liquid solvent that boils violently and evaporates at atmospheric pressure. Consequently, the solution must be maintained at superatmospheric pressure. This solution is then sprayed into the atmosphere in fine droplets. The sudden drop in pressure causes the solvent in each particle to boil violently, thereby breaking up the droplets into still smaller particles. Finally, when all the solvent has evaporated, the solid matter remains suspended in the air.

Dichlorodifluoromethane (also known by its trade-name "Freon 12" and used in cooling systems of air conditioning units) is given as an example of a suitable solvent for pyrethrins.

For another process of dispensing an insecticide in aerosol form, see Patent No. 2,306,434 (A) (same inventors), issued December 26, 1942, entitled Method of Applying Insecticides.

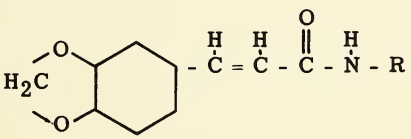
(Ed. Note: This invention has been widely used by our armed forces with great success in combatting mosquitoes, flies and other insects in various parts of the world. Many millions of so-called "aerosol bombs" employing this principle were used.)

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INSECTICIDE

Patent No. 2,326,350 (A) Patent Date: August 10, 1943
Inventors: Samuel I. Gertler and Herbert L. J. Haller

This invention covers insecticidal compositions in which the active ingredients are pyrethrum and any one of a number of compounds represented by the formula:



where R is a radical chosen from the group consisting of methyl, ethyl, propyl, butyl and isobutyl. A specific compound of this class is N-isobutyl-3,4-methylene dioxycinnamamide, also known as fagaramide. The compound appears to be ineffective by itself against flys, but when mixed with pyrethrins, a synergistic action results usually in kills greater than either ingredient alone in the proportions used.

Fagaramide can be prepared synthetically in the laboratory or obtained from the plant Fagara xanthoxyloides, also known as artar root.

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INSECTICIDE

Patent No. 2,328,726 (A) Patent Date: September 7, 1943
Inventors: Frederick B. LaForge and Herbert L. J. Haller

This patent discloses and covers the use of prickly ash, or an extract thereof, as an insecticide. Prickly ash is also known as Zanthoxylum clava-herculis L.

INSECTICIDE

Patent No. 2,332,097 (D) Patent Date: October 19,1943
Inventor: Edward R. McGovran

The invention teaches the use of pyrethrum extract combined with methyl phenyl nitrosoamine, 2,4-diamylcyclohexanol, or di-tert.-amyl phenoxyethanol to produce an insecticide that is more powerful than the additive effect of the ingredients when used alone. For example, the mortality of a 0.05 percent solution of pyrethrins alone against houseflies is 12 percent; of a 5 percent solution of di-tert.-amyl phenoxyethanol, 6 percent. However, when these two materials are combined in these amounts, the combination produces a mortality of 53 percent, almost 3 times as much.

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FUMIGANT BAG

Patent No. 2,342,406 (A) Patent Date: February 22, 1944
Inventors: Randall Latta and Alfred H. Yeomans

The invention is a foldable, air-tight bag into which clothes to be fumigated can be placed, together with a heavy cloth-protected glass ampoule or vial containing a volatile fumigant. After the clothes and ampoule are in the bag, the bag can be sealed. The ampoule is then broken with an object, such as a hammer, or merely by stepping on it with the foot. This releases the fumigant, which then volatilizes and fumigates the clothes. The protecting cloth prevents pieces of broken glass from escaping into the bag.

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SYNERGISTS TO AEROSOL INSECTICIDES

Patent No. 2,345,891 (A) Patent Date: April 4, 1944
Inventors: William N. Sullivan and Lyle D. Goodhue

The invention relates to the use of certain materials which, in themselves, exhibit little or no insecticidal action, but which can be added to other materials having some insecticidal activity for the purpose of increasing the insecticidal action. The added materials (synergists) are generally in the class of detergents or surface active agents in non-aqueous media. Examples of such agents are lauric, oleic, and myristic acids. An example of a specific insecticide whose activity is increased by the addition of such agents is ortho-dichlorobenzene. These are the only agents and insecticide covered by this patent.

However, eighteen other patents (Nos. 2,345,892 to 2,345,909 inclusive, all assigned) obtained on divisional applications cover practically all the combinations disclosed. Other agents covered by these other patents are diglycol laurate, propylene glycol laurate, propylene glycol oleate, sorbitol laurate, monoglycol laurate, spermaceti, salicylic acid, lauryl sulfate, sulphonated naphthalene, and triethanolamine oleate. Other insecticides are 3-chloroacenaphthene, 2-chlorofluorene, methyl chloroacetate, ethyl dichloroacetate, beta-chloroethyl chlorocarbonate, beta-chloroethylacetate, epichlorohydrin, tetrachloroethane, carbazole, 3-chlorodibenzofuran, and thiocresol.

Results are given of tests against flies, German cockroach, carpet beetle larvae, confused flour beetle, and crickets.

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INSECTICIDE

Patent No. 2,349,344 (A) Patent Date: May 23, 1944
Inventors: Samuel I. Gertler and Herbert L. J. Haller

The invention relates to the use of 4-phenylmorpholine as an insecticidal agent.

Results of tests are given against screwworm larvae, Hawaiian beet webworm, southern army worm, melon worm, and cross-striped cabbage worm.

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INSECTICIDE

Patent No. 2,349,814 (D) Patent Date: May 30, 1944
Inventors: Christian C. Deonier and Howard A. Jones

The invention relates to an insecticidal composition comprising a solid solution of the well known insecticide 2,2-bis-(p-chlorophenyl)-1,1,1-trichloroethane (popularly known as DDT, an abreviation of the generic term dichlorodiphenyltrichloroethane) and various materials, such as solid organic acids like stearic acid, hydrogenated cottonseed oil, and cetyl alcohol.

This solid solution provides a homogeneous distribution of the insecticide throughout the product which is superior in efficacy to compositions made by ordinary coatings of the active agent.

In this condition, too, the lasting qualities of the insecticide are better than the untreated insecticides upon exposure to rain.

The solid solution can be ground to a dust and applied as such for killing mosquito larvae.

Notwithstanding the fact that the insecticide is in a diluted form in this solid solution, it is no less toxic initially in this form than equivalent amounts of the untreated insecticide.

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COMPOUNDS OF NICOTINE

Patent No. 2,356,185 (A) Patent Date: August 22, 1944
Inventor: Claude R. Smith

The invention relates to double salts of nicotine and metals, such as copper, zinc, iron, and so forth. The general formula for this class of compounds is

$$MX_n.n(C_{10}H_{14}N_2.HX)$$

where M is iron, zinc, copper, nickel, cobalt, or cadmium, n is an integer corresponding to the valency of M, and X is an acid radical, such as picric, benzoic, salicylic, and o-benzoyl benzoic.

The utility for these compounds indicated in the patent is in connection with insecticides and fungicides.

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INSECT REPELLENT COMPOSITION

Patent No. 2,356,801 (A) Patent Date: August 29, 1944

Inventors: Bernard V. Travis and Howard A. Jones

This invention furnishes a composition which is effective in repelling insects of various kinds and is particularly useful in protecting men in movement through insect-infested areas, such as troops in military campaigns.

The composition contains three ingredients, namely, dimethyl phthalate, 2-ethyl-1,3-hexanediol, and n-butyl mesityl oxide oxalate.

Each of these ingredients was previously known to have some repellent properties, but it was found that by combining them in one composition, the insect repellent effect was far superior to the total effect of the ingredients when used separately. This effect is known as "synergism."

Suggested percentages of the ingredients in the composition are 60,20,20, 80,10,10, and 33-1/3,33-1/3,33-1/3 each, respectively.

Effective results are indicated against various species of insects such as Anopheles quadrimaculatus, Aedes aegypti, and Stomoxys calcitrans.

Good results are also indicated against Eusimulium pecuarum and several species of Aedes in Canada and Oregon.

* * * * * *

LARVICIDE

Patent No. 2,357,717 (D) Patent Date: September 5, 1944

Inventor: Wesley G. Bruce

By feeding zinc stearate to animals on the farm, the development of flies and other insects and larvae in the droppings is prevented.

Daily doses of 4 grams per 100 pounds of weight of the animal are indicated as being effective. The zinc stearate may be mixed with bran or other feed and fed to the animals.

See also Patent No. 2,365,245 (D) entitled Insecticide, dated December 19, 1944, (same inventor) wherein zinc oxide is used for same purpose.

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METHOD OF PURIFYING PYRETHRUM EXTRACT

Patent No. 2,358,392 (A) Patent Date: September 19, 1944

Inventors: Lyle D. Goodhue and Herbert L. J. Haller

This invention provides a method for producing pyrethrum extract, a well-known insecticide, that is free from harsh irritants that cause disagreeable effects upon the respiratory passages or on the skin of man and animals when used in their presence. The pure extract made in accordance with this invention is colorless, is free from objectionable staining properties when used on light colored fabrics, walls or other surfaces, and it has a pleasing odor.

The invention employs molecular distillation. This procedure could not be used effectively in previous processes due to violent foaming which prevented the removal of gaseous components. In accordance with this

invention, this foaming difficulty is overcome by the addition of a small amount of oil, such as vegetable oil, sesame oil, cottonseed oil, olive oil, or others which are liquid at room temperatures. Mineral oils may also be used.

Impure sesame oil containing sesamin is preferred. The sesamin increases the toxicity of pyrethrum extracts and can be collected in the distilled fraction because it has about the same distilling temperature as that of the pyrethrins.

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INSECTICIDE
Patent No. 2,358,942 (D) Patent Date: September 26, 1944
Inventor: Edouard H. Siegler

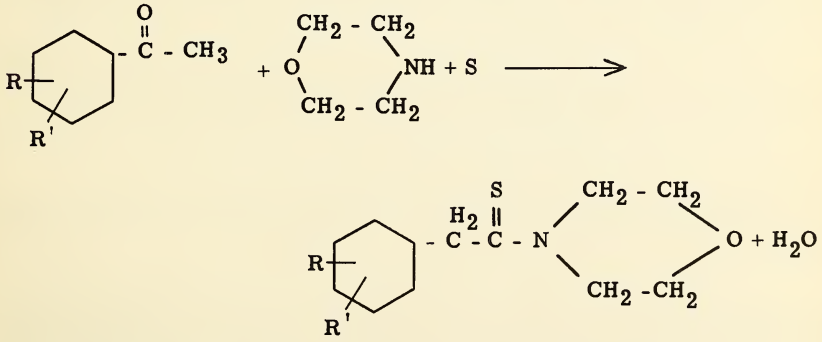
This patent teaches that the insecticidal effectiveness of lead arsenate is increased by mixing it with 2,2-bis(parachlorophenyl)-1,1,1-trichloroethane (popularly known as DDT, an abreviation of the generic term dichlorodiphenyltrichloroethane).

The increase in effectiveness is greater than the additive effect of these two ingredients when used alone, thereby indicating a synergistic action.

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INSECTICIDE
Patent No. 2,358,925 (A) Patent Date: September 26, 1944
Inventors: Herbert L. J. Haller and William F. Barthel

The alpha-thiotoluyl-morpholines are indicated as having effective insecticidal action. Compounds of this class may be prepared by heating methyl aryl ketones with morpholine and sulfur, as indicated below:



R and R' being hydrogen, halogen, alkyl, alkoxy, aryl or aryloxy.

Specifically, the compound 4-(p-methyl-alpha-thiotoluyl)- morpholine is shown to be effective against the 4th instar of melon worm, the European corn borer, 4th instar southern army worm, and the adult blister beetle.

4-(alpha-Thiotoluyl)- morpholine was effective against the same worms and also the pickleworm.

4-(p-Chloro-alpha-thiotoluyl)-morpholine is shown to be effective against the southern armyworm.

4-(p-Methoxy-alpha-thiotoluyl)-morpholine is shown to be effective against the southern army worm and the European corn borer.

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COMBINED INSECTICIDE AND GERMICIDE

Patent No. 2,358,986 (A) Patent Date: September 26, 1944
Inventors: Edward R. McGovran and Lyle D. Goodhue

This invention teaches the use of a combined insecticidal and germicidal composition for dispensing in the form of an aerosol in accordance with the method disclosed in Patent No. 2,321,023 (A). See p. 48.

One of the two claims covers a composition containing olive oil as an agent to modify the size of the aerosol particles.

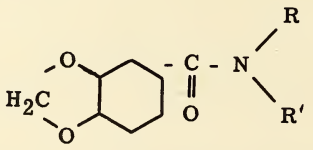
The other claim covers a composition containing 2 to 18 percent pyrethrum extract, 2 to 18 percent propylene glycol, and a mutual solvent dissolved in liquid dichlorodifluoromethane.

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INSECTICIDE

Patent No. 2,362,128 (A) Patent Date: November 7, 1944
Inventors: Samuel I. Gertler and Herbert L. J. Haller

Nitrogen substituted amides of piperonylic acid are indicated as being effective insecticides. These compounds may be represented by the general formula



where R is hydrogen, an alkyl, aryl, halogenated aryl, nitro-substituted aryl, cyclo-aliphatic or aralkyl radical, and R' is an alkyl or aralkyl radical.

These compounds may be prepared by the reaction of piperonoyl with primary or secondary amines. However, any other general method may be used.

A large number of compounds of this class are disclosed with results of tests against flies at various concentrations. Specific compounds covered in the claims in addition to the class generally are (1) N,N-diethylpiperonylamide, (2) N-butylpiperonylamide, and (3) N-isobutylpiperonylamide.

These compounds also exhibit synergism with pyrethrum. Results of fly tests of these ingredients combined are also given.

PURIFICATION OF PYRETHRUM EXTRACT

Patent No. 2,372,183 (D) Patent Date: March 27, 1945

Inventors: William F. Barthel and Herbert L. J. Haller

Impure pyrethrum extract, usually obtained as a solution in a hydrocarbon solvent, such as a refined kerosene or petroleum ether, may be purified, in accordance with this invention, by shaking it with an aliphatic nitro compound of the formula RNO_2, where R is an alkyl group, such as methyl, ethyl, propyl or butyl. This extracts the pyrethrins which may be separated from the hydrocarbon solvent and some of the retained impurities by a separatory funnel or centrifugal separator.

Further purification may be effected with activated carbon.

If still further purification is desired, the concentrate may be mixed with a low boiling hydrocarbon solvent, such as petroleum ether, which dissolves the pyrethrins, but not the remaining impurities. Separation may be effected by decanting or centrifuging.

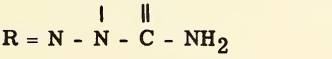
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INSECTICIDE

Patent No. 2,374,479 (A) Patent Date: April 24, 1945

Inventors: Samuel I. Gertler and Herbert L. J. Haller

This invention provides as insecticides certain compounds of the semicarbazone group, having the formula



R representing a cyclo-aliphatic radical which may or may not have a methyl substituent. Specific compounds mentioned are cyclopentanone semicarbazone, cyclohexanone semicarbazone, and methylcyclohexanone semicarbazone.

Tests are shown against newly hatched screwworm larvae, codling moth, Hawaiian beet webworm larvae (fifth instar), melon worm (fourth and fifth instar), southern beet webworm (fifth instar), cross-striped cabbage worm (fifth instar), and southern army worm (fourth instar).

In many cases, results were better or as good as derris or lead arsenate.

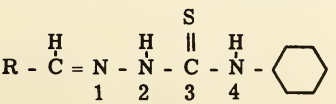
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INSECTICIDE

Patent No. 2,354,192 (A) Patent Date: July 25, 1944

Inventor: Charles Verne Bowen

Compounds of the class consisting of 4-phenyl-3-thiosemicarbazones are indicated as being toxic to insects. The general formula is:



in which the group R - C(H) = represents the residue of an aryl aldehyde, an aralkylene aldehyde or an aldehyde characterized by the presence of a 2-furyl group.

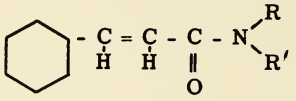
Specific compounds mentioned are (1) benzaldehyde 4-phenyl-3-thiosemicarbazone (tests made against bean leaf roller), (2) salicyl-aldehyde 4-phenyl-3-thiosemicarbazone (tests made against southern army worm and European corn borer larvae), (3) cinnamaldehyde 4-phenyl-3-thiosemicarbazone, (4) 2-furaldehyde 4-phenyl-3-thiosemicarbazone, and (5) 2-furanacrolein 4-phenyl-3-thiosemicarbazone.

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INSECTICIDE

Patent No. 2,354,193 (A) Patent Date: July 25, 1944
Inventor: Charles Verne Bowen

Cinnamamide and substituted cinnamamides may , in accordance with this invention, be used to destroy insects. These compounds may be represented by the formula



in which R and R′ are hydrogen, alkyl radicals, or aryl radicals.

Effective results are shown using cinnamamide against screwworm larvae, codling moth larvae and southern army worm.

Cinnamanilide was effective in tests against the mosquito larvae.

N,N-diethylcinnamamide was effective in tests against screwworm larvae, fourth instar melon worm, 3/4 grown okra caterpillar, fourth instar southern army worm, fifth instar southern beet webworm, second instar squash bugs.

Other compounds found to be toxic were N-isobutylcinnamamide, N-o-tolylcinnamamide, and N-p-tolylcinnamamide.

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FUNGICIDE

Patent No. 2,354,206 (A) Patent Date: July 25, 1944
Inventor: Marion C. Goldsworthy

Phthalic diphenyl guanidine, formed by the combination of two molecules of diphenyl guanidine and one molecule of phthalic acid, is indicated as being an effective fungicide.

When ground to a fine powder, it is white, odorless, non-hygroscopic, insoluble in benzene, gasoline or water, but soluble in alcohol. It has a melting point of 178° C., a flash point above 120° C. and a specific gravity of 1.20.

It is shown to be toxic against spores of fungi causing apple scab, apple bitter rot, peach brown rot, and peach scab without injury to plant sprayed.

INSECTICIDE

Patent No. 2,388,684 (A) Patent Date: November 13, 1945
Inventors: Samuel I. Gertler and Herbert L. J. Haller

This invention teaches the use of semi-carbazones for insecticidal purposes.

The specific compound covered by the claims is benzophenone semi-carbazone, which is indicated as being toxic to screwworm larvae and the imported cabbage worm.

Another compound specifically mentioned is acetophenone semi-carbazone. Results of tests of this compound against larvae of the European corn borer and screwworm are shown.

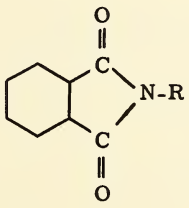
A third compound specifically mentioned is p-chloro-acetophenone semicarbazone which is shown to be toxic against larvae of the European corn borer, codling moth, Hawaiian beet webworm, and the melon worm.

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INSECT REPELLANTS

Patent No. 2,389,427 (A) Patent Date: November 20, 1945
Inventor: Samuel I. Gertler

This invention teaches the use of compounds of the following type as insect repellants:



R being a butyl radical.

N-sec.-butylphthalimide and N-butylphthalimide are indicated as being particularly effective. Specific insects mentioned are Aedes aegypti, a species of mosquito carrying yellow fever, and Anopheles quadrimaculatus, the malaria mosquito.

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INSECT-REPELLANT COMPOSITION

Patent No. 2,390,249 (D) Patent Date: December 4, 1945
Inventors: Stanley A. Hall, Bernard V. Travis and Howard A. Jones

This invention teaches the use of isopropyl cinnamate as an insect repellant. It is indicated as being suitable for application to the skin as shown by toxicological tests on rabbits. It may also be applied to clothing since it is a poor solvent for plastic materials of which articles such as buttons and fountain pens are usually made. It is superior to both methyl and ethyl cinnamate in its repellant properties.

Effectiveness is shown in tests against the yellow fever and malaria mosquitoes, chiggers and the biting and annoying insect Stomoxys calcitrans.

Other cinnamic acid esters found to possess insect-repellant properties include the n-propyl, n-butyl, sec.-butyl, isobutyl, tert.-butyl and cyclohexyl cinnamates.

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DISINFECTANT AND ANTISEPTIC PRODUCT
Patent No. 1,745,507 (D) Patent Date: February 4, 1930
Inventor: Jacob M. Schaffer

This patent covers, as disinifectants and antiseptics, acyl resoricinols that contain more than one carbon atom in the acyl group.

Specific compounds covered are the acetyl, propionyl, butylyl, amylyl, hexylyl, heptylyl and octylyl resorcinols.

See also companion Patent No. 1,745,508 (D) covering amyl and hexyl phenols as antiseptics and germicides.

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PROCESS FOR PREPARING ANTIGENS*
Patent No. 1,816,026 (A) Patent Date: July 28, 1931
Inventor: Jacob M. Schaffer

This invention concerns the preparation of chemical products for use in diagnosing animal diseases, particularly for testing fowl for pullorum disease.

The diagnostic product is made by preparing a heavy suspension of Salmonella pullorum in salt solution and adding to it a formaldehyde solution in an amount sufficient to kill the bacteria. A dye, such as crystal violet, is then added in an amount sufficient to stain the suspended bacteria distinctly. In the case of crystal violet, it would be blue or purple.

This preparation is used by placing a few drops on a glass plate. A drop or two of blood from the fowl to be tested is added to this. In the case of a positive reaction, that is, if the fowl is infected with the disease, the bacteria will collect in the form of blue or purple clumps, when crystal violet is used, which are distinct and may be readily seen especially if viewed against a white background. In the case of a negative reaction, there is only a uniform faintly bluish film without clumping.

Other antigens may be similarly stained, such as the antigen used in the aggutination test for abortion disease in cattle.

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PARASITICIDE
Patent No. 1,950,818 (D) Patent Date: March 13, 1934
Inventors: Jacob M. Schaffer and Frank W. Tilley

Orthophenylphenol is indicated as possessing marked parasiticidal properties. However, its solubility in water is very low, and, in order to utilize it effectively for this purpose, it is dissolved in cocoanut oil soap. Soaps made from other materials may also be used. Any of the alkaline salts of orthophenylphenol may be used.

*Note: Licenses issued under this patent contain special conditions to insure the marketing of the product in a satisfactory form.

Thirty percent glycerine can also be used as a solvent.

Orthophenylphenol is indicated as being non-irritating, as having low-toxicity to higher animals and as being devoid of objectionable odor.

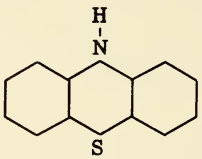
Particular parisites mentioned are bacillus typhosus, staphylococcus aureous, bacillus tuberculosis and lice on hogs and dogs.

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URINARY ANTISEPTIC*

Patent No. 2,085,794 (A) Patent Date: July 6, 1937
Inventors: Floyd DeEds, John O. Thomas and Clyde W. Eddy

This invention teaches the use of phenothiazine and its oxidation derivatives as urinary antiseptics. Phenothiazine has the structural formula:



Results of tests are disclosed showing that phenothiazine, after oral administration, was rapidly absorbed from the digestive tract,converted to one or more of its oxidation derivatives, and excreted in that form through the kidneys and into the bladder, thereby conferring bactericidal properties to the urine. This result is obtained when doses were used below the toxic margin of safety. There is no injury to any part of the body and no tolerance development. The bactericidal properties are effective in acid, alkaline and neutral urines.

See also Patent No. 2,162,686 (A), issued June 13, 1939, for Method for the Preparation of Thionol (same inventors). The method comprises the conversion of phenothiazine to thionol, the latter being also indicated as having urinary antiseptic properties.

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VACCINES AND PROCESS FOR MANUFACTURING VACCINES

Patent No. 2,102,235 (A) Patent Date: December 14, 1937
Inventor: Marion Dorset

A hog cholera vaccine is prepared by taking virus blood from cholera-infected swine, defibrinating the blood and mixing it with an aqueous solution of crystal violet and an antiseptic, such as benzophenol. This is maintained for about two weeks at a temperature of about 37.5° C. until the material becomes incapable of transmitting hog cholera when injected into susceptible swine.

See Patent No. 2,369,267(A) page 62 .

*Note: Licenses issued under this patent contain specific requirements as to purity.

In previous Patent No. 1,784,928 (D) (same inventor), issued December 16, 1930, entitled Vaccine for Hog Cholera and Process for Manufacturing the Same, the virus is treated with formaldehyde to destroy the disease-producing qualities of the virus.

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PARASITICIDE

Patent No. 2,161,261, (D) Patent Date: June 6, 1939
Inventors: Jacob M. Schaffer, Paul D. Harwood and Everett E. Wehr

Chickens, turkeys, and other birds often become infected with a disease known as gapeworms, which is very difficult to treat. The inventors found that particular compounds of a certain class are effective in ridding birds of this disease. These compounds are such antimonyl tartrates that are sparingly soluble in water to the extent of at least 0.01% and not more than 6% at 25° C. Such compounds more soluble than 6% are too toxic. If they are less soluble, they would be too nearly inert. Suitable compounds are barium antimonyl tartrate, silver antimonyl tartrate, stannous antimonyl tartrate, and cadmium antimonyl tartrate.

The compound is administered to the infected fowl in dust form directly into the pharyngeal cavity. The fowl may be placed in a confined space wherein the material in dust form is suspended in the air. Indicated dosage is 1/15 gram per bird.

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PREPARATION OF AMMONIUM ALLANTOINATE

Patent No. 2,303,765 (A) Patent Date: December 1, 1942
Inventor: William Robinson

The invention covered by the patent is a process for making ammonium allantoinate from allantoin and ammonium hydroxide.

The compound is useful as a therapeutic agent to stimulate the healing of wounds and lesions.

Allantoin was discovered as a secretion of blowfly maggots and as being a factor responsible for the healing effects produced by these maggots in slow-healing and discharging wounds.

Ammonia is also useful therapeutically to stimulate healing and is also found in the excretions of blowfly maggots in the forms of ammonium carbonate or bicarbonate. In these forms, it reacts rapidly in wounds and causes discomfort in the form of slight stinging sensation.

The object of the invention is to produce a compound which combines the healing advantages of both allantoin and ammonia without subjecting the patient to the discomforts of the ammonia.

The inventor conceived the idea that allantoin could be combined with ammonia from the fact that allantoin is amphoteric and ammonia is a base. The combination is effected by adding ammonium hydroxide to an aqueous solution of allantoin at a pH of about 8.8. The compound may be made in various concentrations. It is 9% soluble in water as compared to allantoin alone which is only 0.6%.

METHOD OF PREPARING HOG CHOLERA VACCINE

Patent No. 2,369,267 (A) Patent Date: February 13, 1945

Inventor: Frank W. Tilley

This is an improvement on a previous patent to Dorset No. 2,102,235 (D) (See p. 60.)

The improvement resides in the method of producing a vaccine that is more consistently sterile than the Dorset method.

The Dorset method treated the blood virus of infected hogs with crystal violet and incubated the blood virus to destroy its disease-producing principle without destroying its protective properties (antibodies). Dorset also taught the use of benzophenol as an antiseptic. In using the Dorset process, it was found that a sterile vaccine is not consistently produced. This is believed to be due to the ineffectiveness of the benzophenol to sterilize against all types of contaminating organisms.

In the present invention, the hog cholera blood virus is mixed with crystal violet dissolved in glycerol, the latter taking the place of the benzophenol of the Dorset process as the antiseptic.

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BIOCHEMICAL PROCESSES

PROCESS FOR THE MANUFACTURE OF GLUCONIC ACID

Patent No. 1,726,067 (D) Patent Date: August 27, 1929
Inventors: Horace T. Herrick and Orville E. May

These inventors found that gluconic acid can be produced in good yields and without the contamination of other organic acids by cultivating in a solution a suspension of a carbohydrate material containing fungi of the Penicillium group. Particular fungi mentioned are those belonging to the groups P. citrinum, P. divaricatur, and P. luteum purpurogenum.

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METHOD OF CARRYING OUT OXIDATIVE FERMENTATIONS BY MOLDS OR FUNGI

Patent No. 2,006,086 (A) Patent Date: June 25, 1935
Inventors: Orville E. May, Horace T. Herrick, Andrew J. Moyer and Percy A. Wells

In the manufacture of industrial products, such as gluconic and kojic acid from glucose, by fermentation with molds or fungi cultures, the fermentation in accordance with this invention is effected under superatmospheric pressure of gases containing substantial quantities of oxygen while maintaining aeration and agitation of the culture medium. Very high yields are obtained by the use of this method and many subsequent inventions have been based upon it.

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METHOD FOR CARRYING OUT AERATION IN BIOCHEMICAL PROCESSES

Patent No. 2,098,962 (A) Patent Date: November 16, 1937
Inventor: Rudolph Hellbach

The invention is concerned with obtaining efficient aeration in biochemical processes, especially where it is desired to carry out an aerobic fermentation process under pressure and agitation. An apparatus is described for accomplishing the result. The use of the invention in the process of manufacturing various products by fermentation is mentioned, such as gluconic acid, citric acid, kojic acid, lactic acid, dihydroxyacetone, acetylmethyl carbinol, and sorbose.

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METHOD OF CARRYING OUT CERTAIN OXIDATIVE FERMENTATION PROCESSES BY BACTERIA

Patent No. 2,121,533 (A) Patent Date: June 21, 1938
Inventors: Percy A. Wells, Lewis B. Lockwood and Joseph J. Stubbs

This invention can be used in industry for the manufacture of various products by the fermentation of bacteria, especially of the Acetobacter group, in nutrient medium. An example is the production of a ketone from an aliphatic secondary polyhydric alcohol. The manufacture of l-sorbitol from d-sorbitol is specifically mentioned.

The invention is an improvement over previous fermentation methods in that it results in greater yields.

Essentially the process comprises innoculating an aqueous solution of the starting material containing a nutrient with the bacteria and maintaining aeration and agitation of the inoculated solution and keeping it under superatmospheric pressure of gases containing substantial quantities of oxygen.

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FERMENTATION PROCESS FOR THE MANUFACTURE OF DEXTRO-LACTIC ACID

Patent No. 2,132,712 (A) Patent Date: October 11, 1938
Inventors: George E. Ward, Lewis B. Lockwood and Orville E. May

Dextro-lactic acid is produced by cultivating the fungi Rhizopus oryzol in glucose solutions under submerged aerobic conditions and with agitation. Other nutrients are also added to the glucose solution, such as magnesium sulfate, ammonium nitrate, calcium carbonate and urea.

In one respect, the method differs from prior fermentation methods in that the fermentation is effected by a fungus or mold rather than by bacteria, such as Lactobacillus delbruncki and Streptococcus lactis.

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PROCESS FOR PRODUCING LACTIC ACID

Patent No. 2,261,926 (D) Patent Date: November 4, 1941
Inventors: Arthur J. Nolte and Harry W. von Loesecke

The process of this invention makes possible the production of lactic acid from certain fruit juices, particularly grapefruit juice, by the use of micro-organisms naturally present in such juices. A fermentation liquor is prepared from such juices. Its acidity and temperature are controlled so as to be conducive to the growth and maintenance of lactic acid producing organisms, but not other organisms.

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FERMENTATION PROCESS FOR THE PRODUCTION OF 2-KETOGLUCONIC ACID

Patent No. 2,277,716 (A) Patent Date: March 31, 1942
Inventors: Lewis B. Lockwood, George E. Ward, Joseph J. Stubbs, Edward T. Roe and Benjamin Tabenkin

A nutrient carbohydrate mash is inoculated with bacteria of the genus Pseudomonas and cultivated in a submerged state under aeration and agitation, which results in the production of 2-ketogluconic acid.

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FERMENTATION PROCESS FOR THE PRODUCTION OF 5-KETOGLUCONIC ACID

Patent No. 2,318,641 (A) Patent Date: May 11, 1943
Inventors: Joseph J. Stubbs, Lewis B. Lockwood, Edward T. Roe and George E. Ward

Glucose is used as the starting material and bacteria of the genus Acetabacter as the innoculum in the manufacture of 5-ketogluconic acid by fermentation. Cultivation is effected in a submerged state with aeration and agitation.

This acid is useful as a starting material in the manufacturing of tartaric acid.

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PROCESS FOR GLUCONIC ACID PRODUCTION
Patent No. 2,351,500 (A) Patent Date: June 13, 1944
Inventor: Andrew J. Moyer

In the production of gluconic acid by fermentation of glucose, difficulty is encountered when the glucose becomes diluted due to the precipitation of gluconic acid salts, such as calcium gluconate, in the mash. This retards the rate of fermentation.

This difficulty is overcome in accordance with this invention by adding to the mash an agent which prevents the precipitation. Borax and boric acid are two such agents covered by the claims. Other suitable agents mentioned are aluminum chloride, calcium saccharate, calcium mannonate, calcium 2-ketogluconate, calcium lactobionate, calcium lactate, calcium methionate, and calcium idonate.

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LEAVENING PROCESS
Patent No. 2,367,994 (D) Patent Date: January 23, 1945
Inventor: Harold H. Browne

In accordance with conventional bakery practice where bakers yeast is used as the leavening agent, sucrose or malt syrup is added to be fermented by the yeast in which process carbon dioxide is formed causing the dough to rise.

Milk and various milk products used as an ingredient in some doughs contain a sugar called lactose. However, ordinary baker's yeast (Saccharomyces cerevisiae) will not ferment lactose, so that other fermentable sugars must nevertheless be added to such doughs, even though the lactose is present as a potentially available fermentable sugar.

In this invention, the inventor found that certain types of yeast, namely Torula cremoris (#2512 A. T. C. C.) and Torula lactosa (#7014 A. T. C. C.), can be used in baking to ferment the lactose.

Best results are obtained by using a mixture of the lactose fermenting yeast and the baker's yeast, so that both the lactose and other sugars in the dough will be fermented. An increase in the gas production of 25 to 40 percent is indicated in specific instances.

By the use of this invention, it is apparent that considerable savings will result in the use of smaller amounts of saccharine material.

HEAT TRANSFER COMPOSITION

Patent No. 2,369,435 (A) Patent Date: February 13, 1945

Inventors: Robert D. Coghill and Reid T. Milner

This invention teaches the use of levo-2,3-butylene glycol as an anti-freeze or freezing point depressant.

The freezing point of the pure glycol is 19° C., but when mixed with water in varying percentages, it is lowered, the lowest being about −55° C. at 60% concentration by weight.

A fermentation method is suggested for producing it from mashes of grain, sweetpotatoes, or sugar solutions inoculated with strains of Aerobacillus polymyxa.

See also Patent No. 2,359,950 (A) (George E. Ward, Lynferd J. Wickerham, Orpha Glenn Pettijohn and Lewis B. Lockwood, inventors), issued October 10, 1944, entitled Levo-2,3-Butylene Glycol and a Method for Producing Same.

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PROCESS OF PREPARING MILK FOR INFANT FEEDING

Patent No. 1,722,710 (D) Patent Date: July 30, 1929

Inventor: Lore A. Rogers

Ordinary cows milk is first pasteurized in the usual way to destroy enzymes and pathogenic bacteria. It is then homogenized without cooling to prevent separation of the fat on standing. It is then cooled to a suitable temperature for the growth of an acidifying bacteria and inoculated with a suitable culture. Bacteria of the lactobacillus group are essential for this purpose, and a temperature of 40° to 45° C. is necessary to secure the desired acidity in a reasonable time, which should be high enough to insure an acidity in the milk after concentration of pH 3.4 or lower. As an alternative to fermentation, the acidity may be obtained by the addition of lactic acid, lemon juice, or other acids.

It is not necessary to sterilize the milk, since the acidity, if high enough, will prevent growth in the milk of bacteria and yeast. In this condition the milk may be kept indefinitely in air-tight containers to prevent growth of molds.

On diluting with the proper amount of water, it is in good condition to be fed to infants.

This process permits preparation of the milk in large quantities, thereby securing uniformity and economy of production. Also, it renders unnecessary heating of the milk above ordinary pasteurizing temperatures.

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PROCESS OF PRESERVATION OF FRESH FRUITS AND VEGETABLES BY GAS INHIBITION AND REFRIGERATION

Patent No. 1,798,781 (D) Patent Date: March 31, 1931

Inventor: Charles Brooks

When warm fruits and vegetables are placed in refrigerator cars for shipment, they are subject to deterioration and spoilage until their temperature is brought to a sufficiently low point. In order to minimize such spoilage during such periods, carbon dioxide is added to the air in the cars in the amount of from 15 to 40 percent. The percent of carbon dioxide can gradually be reduced while the material is brought under control by refrigeration means.

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PROCESS OF MAKING CHOCOLATE MILK WITHOUT SEDIMENTATION

Patent No. 1,849,030 (D) Patent Date: March 8, 1932

Inventors: Leidy D. Zern and Richard C. Munkwitz

Ordinary chocolate milk has a tendency to develop a very dark cream layer due to some of the cocoa particles adhering to the fat globules. A dark layer on the bottom is caused by some of the cocoa settling out. The milk between these two dark layers is light. This variation in color makes a very undesirable appearance. Practical difficulties are also involved.

The process of the invention results in a chocolate milk that has no sediment. It comprises mixing cocoa and sugar together before stirring into boiling water. The proportions recommended are 5-1/2 quarts of water, 3 pounds of sugar and 1/2 pound of cocoa. After thorough mixing, the mixture is heated to the boiling point and allowed to stand overnight to permit separation of the fibrous material to the bottom, cocoa fat in the form of a white layer at the top and a middle extract layer which is siphoned off and added to whole milk to form a palatable chocolate milk drink which will not have any sedimentation. If desired, the extract may be condensed to a syrup to save storage space. A 3 to 1 ratio of condensation is recommended.

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PROCESS FOR THE PRESERVATION OF EGGS

Patent No. 1,888,415 (D) Patent Date: November 22, 1932
Inventor: Theodore L. Swenson

In accordance with this invention, eggs may be preserved for long periods of time by submerging them in an oil or other sealing or preserving material, such as mineral oil, vegetable gum, and so forth, and subjecting it to a vacuum. The eggs are then brought to the surface and the vacuum released by introducing carbon dioxide gas.

The effect of the vacuum is to withdraw carbon dioxide from the eggs and to force the egg shells to adsorb the oil and seal them with a thin film. Upon release of the vacuum on the eggs in the presence of carbon dioxide, some of the carbon dioxide lost under the vacuum is replaced.

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PROCESS OF PRESERVING OIL BEARING COMMODITIES

Patent No. 1,880,813 (D) Patent Date: October 4, 1932
Inventor: Mayne R. Coe

This patent covers the process of preserving materials subject to rancidity by excluding from them all light having wave lengths below 4900 and above 5600 Ångström units.

In the case of packaged foods, such as potato chips, where customers may wish to inspect the contents, certain green colored transparent paper, acting as a light filter for these undesirable regions of the spectrum, may be used.

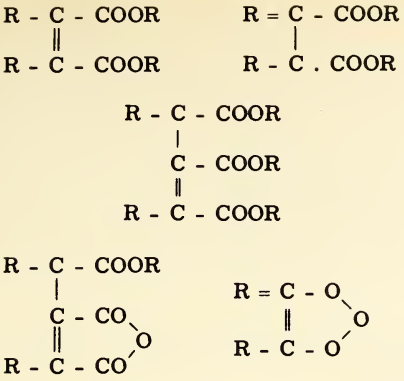
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PROCESS OF INHIBITING OXIDATION OF UNSATURATED FATS, OILS, FATTY ACIDS AND SUBSTANCES CONTAINING FATTY MATERIAL HAVING A TENDENCY TO BECOME RANCID

Patent No. 1,898,363 (D) Patent Date: February 21, 1933
Inventor: George R. Greenbank

Polybasic unsaturated aliphatic acids and certain of their derivatives, such as the esters, salts and anhydrides, are indicated as being effective in retarding the development of rancidity in unsaturated fats, oils, fatty acids and substances containing fatty material.

Suitable compounds for this purpose are those whose molecular structures are in part as follows:



where R may be one or more hydrogen or metallic atoms or any aliphatic group.

Specific compounds mentioned include maleic acid, maleic anhydride, citraconic acid, itaconic acid, and aconitic acid.

The use of quantities as small as 1 part in 10,000 is indicated as having a marked effect.

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STRAWBERRY

Plant Patent 60 (D) Patent Date: April 18, 1933

Inventor: Carl E. Schuster

This patent covers a new variety of strawberry plant. It is a cross between the Marshall strawberry and the Ettersburg #121.

Its characteristics include medium size, uniform ripening qualities, glossy and luminous surface, bright crimson color, a firm to melting texture, and it is very smooth with little trace of core. It has excellent canning and dessert qualities and is adapted to the frozen and late fresh market trade.

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PROCESS FOR COLORING FRUITS AND VEGETABLES

Patent No. 1,920,540 (D) Patent Date: August 1, 1933

Inventors: John R. Winston, Robert Claude Wright and John F. Wooten

In accordance with this invention, the method of coloring fruits and vegetables by means of ethylene gas is improved by maintaining a continuous flow of a uniform concentration of the gas into the coloring chamber where the fruits and vegetables to be colored are placed and preventing the concentration of carbon dioxide by circulating the air in the chamber. At the same time, the humidity is regulated to prevent shrinkage and decay.

Temperatures of 80° to 85° F.; relative humidities of 80 to 85%; and a gas concentration of 1 part gas to 5000 parts air are recommended.

METHOD FOR REDUCING THE VISCOSITY OF A COLLOIDAL SUSPENSION OF PROTEINS

Patent No. 1,952,017 (D) Patent Date: March 20, 1934
Inventors: Alan Leighton and Abraham Leviton

In accordance with this invention, milk sugar (lactose) is removed from milk for the purpose of preventing "sandiness" in the manufacture of ice cream and other confections and food products. The flavor, body and texture of these products are also enhanced. Such removal also permits the use of greater percentages of milk solids in ice cream without danger of "sandiness" which is due to lactose separation in cases where the milk-solids-not-fat content exceeds 10% of the ice cream mix by weight.

The lactose separation is effected by adding cane sugar or sucrose to the milk. This reduces the viscosity of the milk and prevents thickening to such an extent that it is possible to separate the lactose by centrifugal means or filtration when the milk is concentrated and the temperature lowered to force crystallization of the lactose.

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PROCESS FOR PRESERVING FRESH WHOLE MILK

Patent No. 1,964,279 (D) Patent Date: June 26, 1934
Inventor: Byron H. Webb

This invention provides a process for preserving whole milk in a frozen state without destroying the original structure of the milk.

If plain fresh milk is frozen and later thawed, the butter fat emulsion is destroyed and the fat rises to the top unprotected by the milk colloids which originally kept it in an emulsoid state.

This invention is based on the discovery that if the milk is concentrated to 1/3 its original weight, the increased protein concentration protects the fat emulsion during freezing. It this condition it can be preserved for periods up to 8 weeks and may be reconstituted by thawing and adding the required amount of water. The reconstituted milk has the same flavor as normal milk and the appearance of the cream layer upon standing is also the same.

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METHOD OF TREATING MILK

Patent No. 2,010,573 (D) Patent Date: August 6, 1935
Inventor: Byron H. Webb

This invention provides a method of separating colloids from milk which is indicated as having particular application in the ice cream industry and in the manufacture of other milk products.

The colloids are adsorbed upon an immiscible fat phase by forcing the colloid and fat, at a temperature above the melting point of the fat, through a homogenizer at a pressure above 500 pounds per square inch, then freezing the homogenized mixture below 0° C., then thawing the frozen mass at a temperature below the melting point of the fat and drawing off liquid serum that separates during the thawing. The remaining fat with its adsorbed colloids is then heated with water until the fat melts, whereby the colloid particles are redispersed. The fat phase is then separated by a centrifuge leaving for collection the purified colloidal solution.

PROCESS FOR TREATING UNHULLED NUTS

Patent No. 2,010,780 (D) Patent Date: August 6, 1935

Inventors: Edward M. Chace, Daniel G. Sorber, David H. Rundle and Marston H. Kimball

By means of this invention, the removal of hulls from nuts, such as walnuts, is facilitated by treating the unhulled nuts with ethylene gas under proper temperature and humidity conditions which cause the hulls to become crisp and pliable. In this condition, they are easily stripped by the usual hulling devices.

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PROCESS FOR INHIBITING THE DISCOLORATION OF FRUITS AND VEGETABLES

Patent No. 2,011,465 (D) Patent Date: August 13, 1935

Inventors: Arnold K. Balls and Walter S. Hale

Many fruits and vegetables tend to darken at freshly cut surfaces, particularly when exposed to air, due to oxidation of one or more substances in the plant tissue. Such oxidation is accelerated by the presence of oxidative ferments or enzymes present in the fruit or vegetable without which the oxidation would be so slow as to be unimportant.

This invention teaches the use of sulphydryl compounds to inhibit these oxidative enzymes. Such compounds do not possess unpleasant odors or objectionable toxic properties.

Especially suitable for this purpose are the sulphydryl-containing amino acids and peptides built up in part therefrom. The amino acid cysteine and the tripeptide glutathione are recommended, the latter or related compounds being present in the juice of the papaya and pineapple fruit.

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PROCESS OF TREATING SUGAR JUICES

Patent No. 2,043,911 (A) Patent Date: June 9, 1936

Inventor: Emil K. Ventre

This invention provides a method of removing sulphite ions from products made from sugar cane and sugar beets by any of the various sulphitation processes.

Essentially, the process comprises converting the sulphites with an oxidizing agent, such as chlorine, bleaching powder, and, in general, substances containing available chlorine, such as hypochlorite.

The oxidizing agent may be used at any point in the manufacturing process and in quantities to remove any desired proportion of the sulphite ion. Sugars, sirups and molasses of improved quality result from the use of this method by the absence of characteristic sulphite "tang" or tartness.

PROCESS FOR THE ALTERATION OF EGG WHITE

Patent No. 2,054,213 (D) Patent Date: September 15,1936

Inventors: Arnold K. Balls and Theodore L. Swenson

This invention provides a method of changing thick egg whites to thin egg whites, in which form they are more desirable to the various industries using them.

The process involves adding to the thick egg whites enterokinase, a substance which may be prepared from the intestines of pigs. This substance activates the trypsin in egg white which in turn breaks down the protein and renders the egg white thin. The trypsin is largely in an inactive or inhibited condition in normal egg white.

Benzoyl derivates of the amino acids and peptides may be used instead of the enterokinase. Benzoyl glycine is particularly recommended and is specifically covered by divisional Patent No. 2,062,387 (D), issued December 1, 1936.

See also Patent No. 2,073,411 (D), issued March 9, 1937 (same inventors) entitled Process of Producing Thin Egg White. The thick egg white is mixed with additional trypsin which permits the liquefaction to take place in a shorter time and at lower temperatures. Thus, the egg white has less opportunity to become spoiled.

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ARTICLE OF MANUFACTURE

Patent No. 2,056,884 (D) Patent Date: October 6, 1936

Inventor: Byron C. Brunstetter

This invention relates to a process for making sweet potato chips. It is somewhat similar to the making of Irish potato chips, except that the temperature used is lower. Also, the sweet potatoes do not require peeling, and the slices need not be washed.

The whole sweet potatoes are first washed, sliced and heated in fat at a temperature of 248° to 302° F. for about 8 minutes. The excess fat is then drained off. If desired, the slices may then be candied by heating them for about a minute in a boiling sugar syrup to which salt and dextrine have been added.

Other variations of the process are also disclosed.

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PROCESS FOR THE PURIFICATION OF EXTRACTED HONEY

Patent No. 2,070,171 (D) Patent Date: February 9, 1937

Inventors: Rex E. Lothrop and Howard S. Paine

Extracted honey contains finely divided particles of various substances that remain suspended throughout the honey and impart to it a distinctly cloudy or turbid appearance. Minute air bubbles also contribute to this appearance. These foreign materials also contribute to the formation of surface foam and scum and hasten granulation of bottled honey.

This invention provides a method for removing these foreign bodies from honey without modification or loss of the flavor. Essentially, it

comprises forming a syrup of the honey consisting of about 9 pounds of water to 36 pounds of honey and incorporating in it diatomaceous earth from which adsorbed air has been removed by suspension in boiling water. Any water wetting the mass is thereby removed. The mass is then subject to heat and filtered which results in a clear honey free from suspended matter that can be bottled immediately.

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PROCESS FOR PRESERVING OILS AND FATS
Patent No. 2,097,516 (D) Patent Date: November 2, 1937
Inventor: Mayne R. Coe

This invention proposes the use of substantially pure catalase as an inhibitor to the development of rancidity in oil or fat bearing commodities.

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METHOD FOR THE SOFTENING OF DOUGH
Patent No. 2,103,443 (D) Patent Date: December 28, 1937
Inventors: Arnold K. Balls and Walter S. Hale

The object of the invention is to soften dough in instances where a softer dough is desired. Certain types of flour and conditions of baking normally result in doughs which are not suitable to the baker insofar as softness is concerned.

Dough-forming properties of flour are due to the presence of the gluten protein. Flour also contains an enzyme which has the power to split this protein. Such splitting results in softening the dough, but this enzyme is for the most part in an inactive form.

This invention provides a method of activating this enzyme to its protein splitting form. This is accomplished by adding to the dough glutathione in small regulated amounts.

Sulphydryl compounds in general may be used to produce the same effect. A natural product containing such compounds is pineapple juice.

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PROCESS OF MAKING FOOD PRODUCT
Patent No. 2,105,977 (D) Patent Date: January 18, 1938
Inventors: Gaston J. Ley, John H. Payne, and George Akau

In processing taro for the purpose of making flour and other dehydrated materials, difficulties are encountered due to the natural stickiness or viscous character of the material.

To obviate this undesirable condition, the material, after the usual cooking, peeling, and washing, is subjected to refrigeration which frees it entirely of its gumminess.

The refrigeration temperature should be slightly above freezing and is maintained for a period of about 30 hours.

See also Patent No. 2,108,897 (D), dated February 22, 1938, (same inventors and title) wherein heat treatments are disclosed for producing

taro meal that does not revert to an amorphus viscous mass when hot liquid is added, thereby making it feasible for use in preparing such products as mush, puddings, muffins, waffles, etc.

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PROCESS FOR REDUCING FOAM OF FERMENTED EGG WHITE TO LIQUID ALBUMEN AND THINNING FRESH EGG WHITES

Patent No. 2,110,613 (D) Patent Date: March 8, 1938
Inventor: Theodore L. Swenson

In some commercial processes liquid egg white is allowed to thin down through natural fermentation, and a heavy spongy, stringy mass of foam collects on top. In order to reduce this foam to clean, sweet liquid albumen, it is, in accordance with this invention, separated from the fermented liquid and a suitable acid added to it, such as citric acid, to bring the pH in the range of 4.7 to 6.9. A proteolytic enzyme which will act in an acid medium, such as pepsin, papain, or bromelin is then dissolved in a small amount of citric acid and added to the foam in the approximate proportion of 1 part enzyme to 10,000 parts foam. This is allowed to stand a few hours which gives the desired result.

This process can also be used to thin fresh egg whites preparatory to drying. It reduces undesirable foam to a negligible quantity.

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PROCESS FOR THE RECOVERY OF LACTOSE FROM WHEY

Patent No. 2,116,931 (A) Patent Date: May 10, 1938
Inventor: Abraham Leviton

This invention provides a method of recovering lactose from whey in high yields, of high purity and in such a manner that the proteins in the whey are not denatured. Both the proteins and the whey have commercial value.

In accordance with the invention, alcohol and water are added to the whey at room temperature in an amount sufficient to produce a mixture containing at least 4 parts of 95 percent alcohol by volume to 1 part of water. This mixture is agitated and forms a supersaturated solution of the lactose great enough to permit its filtration from any undissolved material. Very little of the whey protein is dissolved and that which remains undissolved is not denatured.

After filtering, the filtrate is acidified and the lactose recovered.

See also Patent No. 2,129,222 (A) (same inventor), issued September 6, 1938, entitled Process for the Recovery of a Soluble Protein Powder from Whey.

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PROCESS FOR PREPARING A USEFUL MILK SERUM OR WHEY PRODUCT
Patent No. 2,119,614 (D) Patent Date: June 7, 1938
Inventors: Byron H. Webb and Guy A. Ramsdell

The whey or serum of milk, a by-product of cheese manufacturers, is that part which remains after the fat and casein are removed by acid or rennet coagulation or other methods. Lactose is its principal ingredient, and it contains about one-half the food value of the whole milk. It has unique characteristics which make it possible to use it in many food products. For example, in some cases, it can be used as a substitute for egg whites.

The present invention is an inexpensive process for preserving this serum or whey so that it can be stored and subsequently used in various food products. In general, the process comprises adding sucrose to the serum or a modified form of the serum, and then condensing the mixture to a heavy syrup, and finally crystallizing the lactose as small crystals. This concentrated serum contains sufficient sugar to preserve it for long periods at ordinary storage temperatures.

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SWEETPOTATO SIRUP
Patent No. 2,126,133 (D) Patent Date: August 9, 1938
Inventors: Howard S. Paine and Elias Yanovsky

This invention provides a process for producing a fermentable sirup from sweetpotatoes as a brewing adjunct.

The process employs the acid hydrolysis method and the sirup produced is easily fermentable by ordinary beer yeast. The proportion of non-sugar constituents in the sirup which give the necessary "body" or unfermented "extract" to the finished beer can be varied within a wide range by varying certain conditions in the process.

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PROCESS TO PREVENT THE OILING OFF OR LEAKAGE OF BUTTERFAT IN CHEESE
Patent No. 2,127,453 (D) Patent Date: August 16, 1938
Inventors: Harry L. Wilson and William T. Johnson, Jr.

Cheese is high in butterfat content. When it is held at temperatures above 70° F., as is often the case in homes, stores, curing rooms, and so forth, the butterfat softens and some of it runs out of the cheese. This reduces the quality of the cheese, and the purpose of the invention is to prevent this condition.

The essence of the invention is to separate the cream from the skim milk before the cheese is manufactured and to homogenize the cream separately from the skim milk. Homogenizing the whole milk is not recommended because it adversely affects the flavor and body of the cheese. It would also be more difficult.

The cream should have a high percentage of butterfat, preferably 40%, and it is homogenized under such conditions of temperature and pressure as to give maximum emulsification of the fat.

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FRUIT WHIP AND PROCESS FOR THE PREPARATION THEREOF

Patent No. 2,131,650 (A) Patent Date: September 27, 1938

Inventor: Byron H. Webb

When acid foods, such as pineapple, citrus and other fruit juices, strawberries, loganberries, etc., are added to milk in the preparation of many food products, such as ice cream and various beverages, the casein is coagulated by the acid. This had made it impossible heretofore to prepare successfully products containing any appreciable quantity of milk. This is obviated by the invention.

The essence of the invention resides in the use of casein-free milk in the form of soluble milk serum. This may be mixed with crushed fruit and flavoring materials. The milk serum solid present should be from 6 to 14%. Such a mixture is capable of producing a stable whip which is an important feature of the invention. Gelatine may also be added. Soluble whey powder may be used for soluble milk serum.

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METHOD FOR TREATMENT AND DEHYDRATION OF FLESHY PLANT MATERIALS

Patent No. 2,137,890 (D) Patent Date: November 22, 1938

Inventor: Edwin F. Hopkins

In accordance with this invention, fleshy fruits and vegetables are treated with chemical agents which make the plant cells permeable and hence result in easier and more rapid dehydration, either by evaporation, pressing, or diffusion processes.

Suitable chemical agents indicated are carbon tetrachloride, chloroform, carbon bisulfide, petroleum ether, toluene, ether, benzol, gasoline, and other organic liquids, such as aliphatic esters. Vapors of these chemical agents may also be used as well as vapors of gases such as sulphur dioxide and chlorine.

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METHOD FOR STORING, TRANSPORTING AND RESTORING SWEET CREAM

Patent No. 2,142,864 (D) Patent Date: January 3, 1939

Inventor: Owen E. Williams

This patent teaches that by adding about 7% of ordinary salt to sweet cream bacterial development is effectively retarded, thereby permitting storage and shipment at ordinary temperatures for periods of about a week in delivering it from farms to creameries. At the creamery, the salt may be removed by centrifuging without destroying the emulsion or damaging the cream.

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FOOD PRODUCT

Patent No. 2,185,451 (D) Patent Date: January 2, 1940

Inventor: Byron H. Webb

This invention provides a new food product made from potatoes and milk, two of the nation's basic foods.

The ingredients are boiled mashed white potatoes, salt and a fat-free milk product, such as dry skim milk, buttermilk, or whey. The addition of casein furnishes a slight cheese flavor.

The three ingredients are mixed together and whipped until the volume is almost doubled. The whip is then dried in a hot air or vacuum drier. The dried product may then be toasted to a light brown color.

No fat is present in the product which permits keeping it for long periods of time without danger of developing off flavors, and no special packaging problems exist.

Recommended proportions of ingredients are:

Potato solids	50 to 85%
Milk-solids-not-fat	5 to 48
Salt	2 to 10

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METHOD OF DRYING GRAIN

Patent No. 2,235,748 (D) Patent Date: March 18, 1941
Inventor: William V. Hukill

Grain drying reduces the moisture content of wheat and minimizes heating during storage. According to this invention, the grain is heated to a temperature such that the grain will not be injured by overheating, but still high enough so that the vapor pressure of the grain is substantially higher than that of moisture in the air available for drying. A temperature of 130° F. is suggested. The air itself is not heated, but the heated grain is immediately subjected to a current of this air. In this manner, evaporation of the moisture in the grain takes place very rapidly.

A drawing shows suitable apparatus for carrying out the process.

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PROCESS FOR THE PREPARATION OF PAPAIN

Patent No. 2,257,218 (A) Patent Date: September 30, 1941
Inventors: Arnold K. Balls, Hans Lineweaver and Sigmund Schwimmer

The enzyme papain is obtained from the latex of the green fruit in such a manner that it retains nearly all the original activity of the latex and may be stored for long periods without deterioration. Also, the natural activation of the proteolytic enzyme that occurs in the latex remains in the preparation.

In accordance with this invention, the fresh latex is mixed with common salt so that the salt becomes dissolved in the water in the latex. It is then partially dried to a paste until the water remaining is nearly saturated with the salt. The purpose is to get rid of the water which is excess weight. The resulting product is a grayish white, thick paste that can be packaged in an air-tight container, such as a bottle, an enameled tin or a collapsible tube.

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PROCESS FOR CURING VANILLA BEANS

Patent No. 2,274,120 (D) Patent Date: February 24, 1942

Inventors: Arnold K. Balls, Arthur G. Kevorkian and Francisca E. Arana

The novelty of the invention resides in the freezing of vanilla beans as a preliminary step to the usual process of curing them. This treatment is alleged to enhance their appearance and aroma. The phenolic content is increased due to the fact that the freezing lowers the respiration action of the beans and thereby reduces the amount of initial oxidation.

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SUGAR FROM SORGHUM JUICES

Patent No. 2,280,085 (A) Patent Date: April 21, 1942

Inventors: Emil K. Ventre and Howard S. Paine

This invention provides a process for obtaining sugar from sorghum juices, such that, in the case of at least some varieties of sorgo, as much sugar can be obtained as is obtainable from the average Louisiana sugarcane.

The essence of the invention lies in the removal from the sorghum juices of materials which interfere with sucrose crystallization. The inventors found these materials to consist principally of starch instead of "gums," as it was previously supposed. The removal of the starch is effected by first centrifuging the cold juice. This removes about 70% of the starch, which is in itself a useful byproduct. The remainder is limed at a pH of 8.4 to 8.6 and defecated. This results in removal of about 20 to 22% more starch. The remaining 8 to 10% of starch is converted by a starch-converting enzyme.

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PROTEOLYTIC ENZYME PROCESS

Patent No. 2,313,875 (D) Patent Date: March 16, 1943

Inventors: Eugene F. Jansen and Arnold K. Balls

By this process, a new product which the inventors have named "chymopapain" is obtained from the latex of papaya. This new product is a proteolytic enzyme which has the ability to clot milk about twice as great as the enzyme papain, and has the further advantage that it is resistant to high concentrations of acid which is beneficial for use in the human diet to be effective at points in the body beyond the stomach.

The undried latex is acidified to a pH of about 2. The material, still in solution, is separated out and a small amount of inert protein is precipitated from it by half-saturation with sodium chloride. The inert protein is then removed and the remaining liquid is saturated with sodium chloride while maintaining the pH at about 2. This results in precipitation of the chymopapain which is then separated from the liquid.

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PROCESS FOR THE CURING AND PRESERVATION OF ANIMAL AND FISH PRODUCTS

Patent No. 2,349,836 (A) Patent Date: May 30, 1944
Inventor: Leander S. Stuart

The use of common salt to preserve protogenous materials, such as skins, hides, fish and animal intestines, has long been known. However, salt alone is not an ideal preservative, except under conditions of partial dehydration, which is difficult to attain, since some types of organisms will grow in its presence, thereby bringing about putrefaction, rancidity and spoilage. It has been proposed, therefore, to add to the salt other chemicals of a bacteriostatic or germicidal nature. However, chemicals of this kind heretofore suggested were not satisfactory in one respect or another. They would render the product unfit for use as food, impart obnoxious odors or flavors, or be undesirable in other respects.

This invention provides chemicals for use in this connection which are not toxic in the concentrations employed and are devoid of obnoxious flavors and odors. These chemicals are (1) the monohalide derivatives of the aliphatic acids and their alkali salts and (2) para-aminobenzoic acid and its alkyl esters.

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DERIVATIVES OF ASCORBIC ACID

Patent No. 2,350,435 (A) Patent Date: June 6, 1944
Inventors: Percy A. Wells and Daniel Swern

The invention relates to compounds of the ascorbic acid series, particularly carboxylic acid esters thereof, and to methods for making them.

The compounds are of the formula

$$\begin{array}{l} \qquad\qquad\qquad\qquad\quad OR' \\ CO - C(OH) = C(OH) - CH - CH - CH_2OR \\ \qquad\qquad\quad O \end{array}$$

one of R and R′ representing an aryl radical of a saturated aliphatic monocarboxylic acid and the other a hydrogen atom.

Characteristically, the ene-diol group is unsubstituted.

Specific compounds are ascorbyl monolaurate, ascorbyl monopalmitate, and ascorbyl monostearate.

The process is generally carried out by reacting a compound of the ascorbic acid series with a saturated aliphatic monocarboxylic acid in the presence of concentrated sulfuric acid.

Both d and l forms of ascorbic acid are included, the latter being Vitamin C.

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PREPARATION OF PECTASE

Patent No. 2,358,429 (A) Patent Date: September 19, 1944

Inventors: John J. Willaman and Claude H. Hills

This invention provides a method for obtaining the enzyme pectase in a pure form in either water or in a dry, stable material from plant materials, such as tomatoes and eggplants. Other plant materials also contain pectase, such as lilac leaves, alfalfa, molds, tobacco stems and leaves, and cherries.

The invention makes use of the discovery that pectase is largely adsorbent on pulp and cellulose materials at a relatively low pH of 3 to 4, but is largely desorbed at a higher pH of 5 to 7.

Accordingly, the pulpy plant juice is adjusted to a pH lower than 5 to cause adsorption of the pectase in the pulp. The pulp is then separated from the juice and suspended in a water medium having a pH of 5 to 7, whereby the pectase is desorbed from the pulpy material and dissolved in the water medium. The pulpy material is then removed from the serum solution.

If a dry pectase preparation is desired, the water may be removed by any known method, such as drying in a current of air.

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METHOD OF PREPARING PECTINATE

Patent No. 2,358,430 (A) Patent Date: September 19, 1944

Inventors: John J. Willaman, Hugh H. Mottern, Claude H. Hills and George L. Baker

This invention provides a method for lowering the methoxy content of pectic materials to any degree desired. Only moderate temperatures are employed. Reaction times are short, and highly corrosive chemicals are not used.

The invention makes use of the enzyme pectase which is added to a solution of pectin. The pectase should be essentially free from pectinase to prevent splitting of the pectin molecules with loss of gel strength. The pectin solution should have a pH favorable to the action of pectase and not unfavorable to the pectin, such as pH 6. This can be controlled by addition of an alkali, such as sodium hydroxide.

The enzyme pectase acts on the methoxy groups forming free acid groups. This lowers the pH and hence additional alkali must be added to maintain the optimum pH. This may be continued until the desired degree of demethoxylation has been reached and then arrested by inactivating the enzyme with heat. The heating may be preceded by the addition of a strong acid to lower the pH to about 3 to 4.

The pectinic acids thus prepared can be worked up in any conventional way desired, such as by precipitating with alcohol, filtering and drying.

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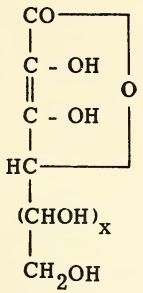
ANTIOXIDANT

Patent No. 2,368,435 (A) Patent Date: January 30, 1945

Inventor: Percy A. Wells and Roy W. Riemenschneider

This invention provides a series of compounds as inhibitors of oxidative rancidity in oleaginous materials of the glyceride type and other esters and fat acids, such as lard, peanut oil, cottonseed oil and various vegetable shortenings.

Particular compounds of this class of inhibitors are d-isoascorbyl palmitate, d-isoascorbyl laurate, d-isoascorbyl stearate and the corresponding l forms of these esters. In general, suitable compounds are the monoesters of unsaturated monocarboxylic acid containing 12 to 18 carbon atoms per molecule and a compound having the general formula



where x is 0, 1, 2 or 3.

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PROCESS FOR THE PRODUCTION OF WHEAT STARCH

Patent No. 2,368,668 (A) Patent Date: February 6, 1945

Inventors: Cecil T. Langford and Richard L. Slotter

Unlike other cereals, such as rice, corn, and rye, it is very difficult to separate starch from wheat. This is due to the fact that the gluten in wheat swells on contact with water and forms a doughy mass to which the starch granules adhere tenaciously.

Most of the previous methods for obtaining starch from wheat have been commercially unsuccessful due to the difficulties encountered by reason of this dough-forming property of the gluten.

This invention overcomes these difficulties by first soaking the whole wheat grains in a water solution of sulfurous acid. The acid modifies the gluten to such an extent that it no longer forms a doughy mass. This permits subsequent removal of the starch in the same way that starch is obtained from other cereal grains, such as corn. The treated wheat grains are ground and a water slurry is made. The coarse particles of the slurry are separated by screening and the screened material allowed to settle. This yields a sediment of wheat starch and a supernatant layer consisting of an aqueous suspension of wheat gluten, which can be separated in accordance with any of the known methods used in the starch industry.

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ANTIOXIDANTS

Patent No. 2,373,192 (A) Patent Date: April 10, 1945
Inventor: Walter M. Lauer

This invention teaches the use of a specific material to prevent rancidity caused by oxidation for commodities commonly used in foodstuffs, pharmaceuticals and medicines, such as lard, butter, lanolin, cottonseed oil, corn oil, soya bean oil, fish liver oils, greases, and other oils and fats.

The material is known as nordihydroguaiaretic acid or beta, gamma-dimethyl-alpha, delta-bis (3,4-dihydroxyphenyl) butane.

It may be prepared synthetically or extracted from plants containing it.

It is only necessary to use a fractional percentage (less than 1%) of the material to obtain effective results over long periods. The preferred range is indicated as 0.01 to 0.05%.

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THICKENING AND CONGEALING AGENT

Patent No. 2,372,729 (A) Patent Date: April 17, 1945
Inventor: John J. Willaman

This invention provides the combination of pectin, pectase, and a soluble salt of a polyvalent metal, preferably a calcium salt, such as calcium acetate, as a thickening or congealing agent for use in preparing foods, such as solid salads, aspics, jellies, puddings, sirups, and catsup, as well as for non-food materials.

When these ingredients are dissolved in water, the pectase causes the hydrolysis of the methyl ester groups of the pectin. This results in the formation of pectinates. The polyvalent metal of the soluble salt combines with the pectinates to form a viscous solution or a solid gel depending on the concentration of the reacting constituents.

The composition may be conveniently prepared in dry form for mixing with water-containing materials that is to be thickened or congealed.

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ANTIOXIDANT COMPOSITIONS

Patent No. 2,375,250 (A) Patent Date: May 8, 1945
Inventors: Roy W. Riemenschneider and Jack Turer

This invention is related to the one covered in Patent No.2,368,435 (A) (see p. 81), wherein it is taught that ascorbyl monoesters of fat acids possess rancidity-inhibiting properties. In accordance with this invention, the antioxidant properties of these acids are greatly increased by using them in conjunction with alpha-tocopherol (Vitamin E), its isomers or analogues. The increase in stability of fatty materials against oxidative rancidity by the use of these two ingredients is much greater that the additive effect of either substances used singly. Drip rendered lard containing 0.05% d-isoascorbyl palmitate and 0.02% alpha-tocopherol had a stability of 32 hours under the Swift stability test.

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See also Patent No. 2,383,815 (A), issued August 28, 1945 (same inventors) entitled Ternary Synergistic Antioxidant Composition, wherein the rancidity-inhibiting properties of the above compositions are increased by the addition of phospholipids, such as soybean phospholipids (commercial lecithin).

See also Patent No. 2,383,816 (A) issued August 28, 1945 (same inventors) entitled Alkali Compounds Containing Anti-oxidant Composition, wherein the antioxidant properties of the ascorbyl monoesters of fat acids are enhanced by the presence of small amounts of alkali compounds, such as an alkali soap plus an alkali carbonate or bicarbonate. The combination of sodium stearate and sodium bicarbonate is specifically mentioned.

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METHOD OF EXTRACTING PECTINOUS MATERIALS

Patent No. 2,375,376 (A) Patent Date: May 8, 1945
Inventors: William Dayton Maclay and John P. Nielsen

This invention provides a process for extracting pectinous materials in greater yields and in a shorter period of time than was possible by previous methods.

The problem of extracting pectin is essentially a matter of treating plant material containing them, such as orange, lemon, and grapefruit peel, in such a manner as to liberate the soluble pectin from the insoluble protopectin.

In accordance with this invention, the pectin-containing material is dispersed in water, and the pH is adjusted to about 2 to 4 with a mineral acid. To this is added a calcium complex-forming agent, such as sodium hexametaphosphate, sodium tetrametaphosphate or sodium tetraphosphate in a concentration of about 0.25 to 0.5%. This mixture is then heated at about 60° C. to boiling temperature for about 10 to 120 minutes. After that the extraction mixture is filtered, and the pectinous material is precipitated in 50% ethanol. The precipitate is then hardened and dried.

It is indicated that by this process yields are increased from 25 to 60% over previous methods.

For another process, see Patent No. 1,892,536 (D), issued December 27, 1932 (Philip B. Myers and George L. Baker, inventors), entitled Process of Extracting Pectin from Pectic Materials.

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HARD WAXES AND FATTY PRODUCTS DERIVED FROM CRUDE SUGAR CANE WAXES

Patent No. 2,381,420 (A) Patent Date: August 7, 1945
Inventor: Royal T. Balch

In the manufacture of sugar cane, certain waste products contain waxes, particularly the clarification muds, which contain them in high proportions. These waxes have industrial uses, but the presence of some of the non-wax constituents interferes with their industrial use.

The invention is a process for treating these waste products so as to recover the waxes in a hard form without the detrimental non-wax constituents. The process also permits recovery of the fatty constituents of

the waste in separate fractions.

In accordance with the invention, the waxes are first extracted from the waste material with a solvent such as toluene. The solvent is then evaporated and recovered from the crude wax residue which solidifies. A selective solvent is then added to the solidified residue which contains both the waxes and the fatty constituents. Preferred selective solvents are acetone and methyl ethyl ketone. Others are ethyl ether, petroleum and certain products such as heptane, hexane and those rich in pentanes. The fatty portion diffuses into the solvent which may then be drawn off. This selective solvent treatment may be repeated to increase the thoroughness of separation (3 to 7 times suggested). The solvent is then recovered from both the wax residue and the fatty portion.

The fatty portion contains mixed fractions which may be easily separated by distillation and alcohol extraction. The principal fractions are crystalline sterols, free fatty acids that are semi-solid and a residue containing natural oils and other fat like components. A substantial portion of this residue is carotene (provitamin A).

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METHOD OF TREATING CEREAL GRAINS

Patent No. 2,381,421 (A) Patent Date: August 7, 1945

Inventors: Arnold K. Balls and Walter S. Hale

When grains, such as wheat, corn, rye, barley, oats, etc., are stored in large bins, they are subject to spontaneous heating which may damage them. Such heating is due largely to respiratory action. Living grains are a dormant form of life absorbing oxygen and liberating carbon dioxide. This respiratory action causes heat which may not be dissipated fast enough when the grain is stored in large bulk to prevent the temperature from rising too high. Mold may form on the grain too, especially if it is damp. Molds also respire and hence add to the generation of heat.

In accordance with this invention the heating is diminished by reducing the biological activity of the grain to a low level with ethylene gas.

The gas is applied to the grain, either while being charged into the storage bin or after it is in the bin. In applying the gas, it is first diluted with 10,000 to 100,000 parts of air.

A table shows that where the temperature of untreated wheat in storage rose 20° F. in 10 days, the temperature of similarly stored wheat treated in accordance with this invention rose only 3° F. during the same period.

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PROCESS FOR EXTRACTING OIL FROM AVOCADOS

Patent No. 2,383,398 (D) Patent Date: August 21, 1945

Inventor: Howard T. Love

This invention provides an inexpensive and rapid method of extracting oil from avocados. It obviates the need for dehydration as required in previous processes and results in a cold processed oil, free of excessive coloring matter and disagreeable taste.

The essence of the invention lies in the use of a chemical agent to react with the protopectin of the cell walls within which the oil is held as an oil-water emulsion. This reaction disintegrates the cell walls. At the same time the oil-water emulsion is broken which permits the oil to be separated by any of the usual methods.

The preferred chemical reagent is calcium oxide (unslacked lime) which is mixed with the undried fruit after it is ground to a homogenous paste. If a green oil is desired, the mixture is allowed to stand 15 to 30 minutes before making the oil separation. If a yellow oil is desired, the mixture is permitted to stand one hour or more.

Other chemical reagents which may be used are hydroxides of calcium, magnesium, sodium, and potassium, and the halides of calcium, magnesium, zinc and aluminum.

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METHOD FOR ACCELERATING THE ALKALINE DE-ESTERIFICATION OF PECTIN

Patent No. 2,386,323 (A) Patent Date: October 9, 1945
Inventors: Hans Lineweaver and Rolland M. McCready

The efficiency of saponification methods for preparing pectinic acids from pectin depends upon the rate of de-esterification of pectin. This invention results in an increase in this efficiency by accelerating the rate of alkaline de-esterification of pectin.

This result is accomplished by adding to a solution or suspension of the pectin material a salt that yields cations in solution. This may be done either before or after the pH is adjusted to the point where de-esterification is to be carried out.

Specific salts mentioned for use in the process are the chlorides of sodium, potasium, calcium and magnesium, sodium sulfate, sodium acetate, and ammonium acetate.

Divalent cations increase the rate about 5 times that obtained in the absence of a salt and about twice as much as that obtained using monovalent cations.

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4-HALOGEN-PARA-PHENYL-ORTHO-BENZOYL-BENZOIC ACID

Patent No. 1,786,526 (D) Patent Date: December 30, 1930
Inventor: Philip H. Groggins

This is one of a series of patents covering the manufacture of intermediates for use in preparing dyestuffs. The particular intermediate covered by this patent is 4-halogen-para-phenyl-ortho-benzoyl-benzoic acid, and the process comprises condensing 4-halogen-diphenyl with phthalic anhydride in the presence of a condensing agent, such as anhydrous aluminum chloride or ferric chloride and then hydrolyzing the resulting reaction product. The halogen group may be replaced with an amino group to yield other compounds of this series by heating with ammonia under pressure. Copper and its salts may be used as acceleration catalysts.

The patents of this series and the intermediates covered by them are as follows:

Patent No.	Date	Compound
1,786,526(D)	Dec. 30, 1930	4-Halogen-para-phenyl-ortho-benzoyl benzoic acid
1,786,527(D)	Dec. 30, 1930	2-Halogen-para-phenyl-ortho-benzoyl benzoic acid
1,786,528(D)	Dec. 30, 1930	4-Amino-para-phenyl-ortho-benzoyl-benzoic acid
1,786,529(D)	Dec. 30, 1930	2-Amino-para-phenyl-ortho-benzoyl-benzoic acid
1,786,530(D)	Dec. 30, 1930	4-Amino-beta-phenyl-anthraquinone
1,786,531(D)	Dec. 30, 1930	2-Amino-beta-phenyl-anthraquinone
1,786,532(D)	Dec. 30, 1930	Para-phenoxy-ortho-benzoyl-benzoic acid
1,814,145(D)	July 14, 1931	Para-phenyl-ortho-benzoyl-benzoic acid
1,814,146(D)	July 14, 1931	4-Halogen-beta-phenyl-anthraquinone
1,814,147(D)	July 14, 1931	2-Halogen-beta-phenyl-anthraquinone
1,814,148(D)	July 14, 1931	4-Amino-beta-phenyl-anthraquinone
1,814,149(D)	July 14, 1931	2-Amino-beta-phenyl-anthraquinone
1,843,718(D)	Feb. 2, 1932	4-Hydroxy-para-phenyl-ortho-benzoyl-benzoic acid
1,843,719(D)	Feb. 2, 1932	2-Hydroxy-para-phenyl-ortho-benzoyl-benzoic acid

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METHOD FOR THE PRODUCTION OF NITROSYLCHLORIDE

Patent No. 1,920,333 (D) Patent Date: August 1, 1933
Inventors: Colin W. Whittaker and Frank O. Lundstrom

In accordance with this invention, nitrosylchloride is formed by contacting oxides of nitrogen, such as nitrogen peroxide,with solid chlorides or solid minerals, salts or mixtures containing chlorides in a humid condition. Examples of such minerals are kainit and muriate which are available in large quantities. Potassium chloride is also mentioned specifically.

The process does not require the use of nitric acid or other solution.

PREPARATION OF AMINO DERIVATIVES OF THE ANTHRAQUINONE SERIES

Patent No. 1,923,618 (D) Patent Date: August 22, 1933
Inventor: Philip H.Groggins

In accordance with this invention, amino derivatives of the anthraquinone series are prepared by heating halogeno anthraquinones with strong aqueous solutions of ammonia under pressure in the presence of oxyhalogen compounds. The reaction is carried out in an autoclave.

A catalyst may be used, such as metallic copper, copper salts, or other metals and their salts which follow copper in the electromotive series. Special mention is made of copper nitrate, cupric oxide and silver chloride.

The advantages of this process are that substantially theoretical yields are obtained, and the products produced are so pure as to render unnecessary special or additional purification steps. Low reaction temperatures may be used (150° to 225° C.), and the quantities of materials per charge can be greatly increased in proportion to the ammonia content in the autoclave.

This process is an improvement over the one set forth by the same inventor in Patent No. 1,892,302 (D), issued December 27, 1932, entitled Preparation of Organic Compounds of the Anthraquinone Series, wherein the reaction is carried out with aqueous ammonia in the presence of inorganic oxidants, such as potassium chlorate and ammonium nitrate.

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PROCESS OF PREPARING ACYLATED PHENOLS

Patent No. 1,933,975 (D) Patent Date: November 7, 1933
Inventors: Herbert L. J. Haller and Paul S. Schaffer

In accordance with this invention, a diazonium borofluoride is reacted with acetic anhydride or acetic acid. Nitrogen is given off, and there is formed a reaction product that is probably a coordination compound of boron fluoride and the acetate of a phenol. This product is then heated in water or in a dilute alcohol to obtain the acetate of the phenol.

By using propionic, butyric, or other acids or anhydrides, the corresponding propionates, butyrates, etc. of the phenols may be obtained.

Specific examples of compounds obtained according to this invention are phenylacetate, m-bromophenylacetate and d-naphthylacetate, although the invention is not limited to them.

The invention has the advantages that the yields are high and that diazonium borofluorides are not explosive when dry as in the case of diazo halides used in previous methods.

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PROCESS FOR THE PREPARATION OF KETONES

Patent No. 1,966,797 (A) Patent Date: July 17, 1934
Inventors: Philip H. Groggins and Ray H. Nagel

Prior to this invention, aryl and dialkyl ketones were made according to the Friedel and Crafts reaction by condensing either acid chlorides or acid anhydrides with aromatic compounds. This is comparatively high in cost.

In accordance with this invention, these compounds can be made by substituting certain organic acids for the more expensive acid chlorides and anhydrides. For example, in the preparation of p-methylacetophenone, ordinary glacial acetic acid can be used.

Other suitable organic acids indicated are butyric and benzoic acids.

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PROCESS FOR THE PREPARATION OF ALKYL ARYL KETONES ACCORDING TO THE FRIEDEL AND CRAFTS REACTION

Patent No. 1,991,743 (A) Patent Date: February 19, 1935
Inventor: Philip H. Groggins

This invention is based on the discovery that in the condensation of aliphatic carboxylic acid anhydrides with aromatic compounds according to the Friedel and Crafts reaction, both acyl groups of the anhydride are available for reaction instead of only one as was previously supposed. Advantage is taken of this knowledge to adjust the proportions of the reactants accordingly and thereby obtain much greater yields.

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PROCESS FOR THE PREPARATION OF ALKYL ARYL KETONES

Patent No. 1,997,213 (A) Patent Date: April 9, 1935
Inventors: Philip H. Groggins and Roy H. Nagel

Alkyl aryl ketones were previously prepared by condensing carboxylic acids or their acid chlorides or anhydrides with aromatic compounds in the presence of aluminum chloride.

The inventors in this case found that the aluminum chloride reacts with aliphatic carboxylic acids and with their anhydrides, such as acetyl chloride and acetic anhydride, to form one molecular proportion each of a volatile acid chloride and a non-volatile residue comprising the aluminum chloride salt of the carboxylic acid employed. This residual complex and an aromatic compound, such as toluene and chlorobenzene, can be made to enter into Friedel and Crafts reactions for the preparation of alkyl aryl ketones.

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PROCESS FOR THE CONDENSATION OF ORGANIC ACIDS AND THEIR ANHYDRIDES ACCORDING TO THE FRIEDEL AND CRAFTS REACTION

Patent No. 1,999,538 (A) Patent Date: April 30, 1935
Inventors: Philip H. Groggins and Ray H. Nagel

In the preparation of ketones, carboxylic acids, keto acids, and other compounds by the condensation of acids and acid anhydrides with aromatic compounds according to the Friedel and Crafts reaction, the inventors found that the addition of halogen carriers, such as metallic iron, aluminum, and zinc, appreciably promotes the condensation and results in higher yields of purer products.

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PROCESS FOR PREPARING USEFUL PRODUCTS ACCORDING TO THE FRIEDEL AND CRAFTS REACTION

Patent No. 2,008,418 (A) Patent Date: July 16, 1935
Inventor: Philip H.Groggins

This invention provides a method of carrying out the Friedel and Crafts reactions for preparing aluminum chloride addition compounds of ketones, keto acids, aldehydes, and other organic compounds in the form of granulated particles, a viscous resinous paste or a fluid suspension.

The invention substitutes for the mill type reactor apparatus a "crystallizing pan" in a housing containing suitable openings for feeding the reactants and removing liberated gases and any desired portion of the liquid reactant or solvent. The apparatus is also provided with means for agitating the charge and a door for discharging the reaction mass.

By these means, continuous control of a reaction may be effected as to temperature, pressure, ratio of reactants, and physical condition of the final product.

The claims cover (1) the process generally, some claims being to the process as applied to specific products and (2) aluminum chloride addition compounds of keto acids and ketones in the form of a dry granulated product.

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PROCESS FOR THE DECOMPOSITION OF NITROSYL CHLORIDE

Patent No. 2,038,083 (D) Patent Date: April 21, 1936
Inventors: Frank O. Lundstrom and Colin W. Whittaker

In accordance with this invention, nitrosyl chloride gas is decomposed and oxidized to form oxides of nitrogen, especially NO_2 and N_2O_4 and chlorine. The gas is mixed with a slight excess of oxygen on a mole to mole basis to form NO_2. This mixture is then dried and heated to a temperature of 150° to 300° C.

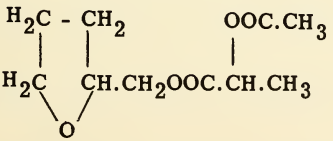
See Patent No. 1,920,333 (D), page 86, for method of producing nitrosylchloride.

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TETRAHYDROFURFURYL ALPHA ACETOXY PROPIONATE

Patent No. 2,222,363 (D) Patent Date: November 19, 1940
Inventor: Houston V. Claborn

This invention provides a new compound, namely, tetrahydrofurfuryl alpha acetoxypropionate, having the formula



This compound is useful as a solvent and as an intermediate in the production of tetrahydrofurfuryl acrylate, a substance polymerizable to plastic, semi-solid, or solid materials useful in industry because of their

tensile strength, elasticity, plasticity, resistance to water, organic liquids and gases, and other desirable properties.

The new compound of this invention is a colorless liquid at 25°C., boiling at about 139° C. at 10 mm. pressure. It has a specific gravity of about 1.1245 at 25° C., and a refractive index for the yellow sodium line of about 1.4440 at 25° C.

This compound may be made by acetylating tetrahydrofurfuryl lactate. Acetic anhydride is a suitable acetylating agent, but ketene is preferred.

See also Patent No. 2,229,997 (D), dated January 28, 1941, covering an invention by same inventor for Process for the Manufacture of Tetrahydrofurfuryl Acrylate and its Polymers. The process comprises pyrolyzing tetrahydrofurfuryl alpha-acetoxypropionate.

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PROCESS FOR THE PRODUCTION OF CHLORINE

Patent No. 2,240,668 (A) Patent Date: May 6, 1941

Inventor: Donald L. Reed

From the gaseous products resulting from the manufacture of potassium nitrate from potassium chloride and nitric acid, chlorine is produced and fixed nitrogen recovered.

Decomposition and oxidation of nitrosyl chloride and hydrogen chloride by oxygen or an oxygen containing gas is effected to form chlorine, nitrogen peroxide, nitric acid and water. The reactions are effected at moderate temperatures below that required for thermal decomposition.

The essence of the invention is the use of the selective adsorption properties of activated silica to establish a particular set of conditions which favor the oxidation.

Activated silica in forms such as xerogel, aerogel, silica gel or "glaucosil" may be used.

(See also Patent No. 2,309,919 (A), p. 92).

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PROCESS FOR PRODUCING ALDEHYDES

Patent No. 2,285,059 (A) Patent Date: June 2, 1942

Inventors: John T. Scanlan and Daniel Swern

This invention provides a new method for preparing aldehydes from starting materials of the group comprising unsaturated fatty acids containing 3 or more carbon atoms, their esters, including glycerides, the corresponding alcohols and certain derivatives and substitution products of any of them. The starting material should contain one or more ethylenic linkages. Suitable raw materials are the cheap and abundant fats and fatty oils of animal and vegetable origin, such as lard or lard oil, cottonseed oil, peanut oil, olive oil, castor oil, and the fatty acids, esters, and alcohols which can be derived from them.

Because of the high reactivity of aldehydes, the products of this invention are useful as raw materials in the manufacture of many industrial

products, such as perfumes, flavors, rubber accelerators, pharmaceuticals, synthetic resins, plasticizers, artificial silk, and other products.

The mechanism of the process comprises converting the ethylenic linkages (- CH = CH -) to alpha-glycol groups (- CH - CH -) with OH OH and splitting the chain at one or more of such glycol linkages, resulting in the formation of aldehyde groups.

The process is carried out by first hydroxylating the starting material with 30% hydrogen peroxide in glacial acetic acid. The reaction product is then treated in acetic acid solution with a slight excess of one equivalent of red lead (Pb_3O_4) for each pair of hydroxl groups to form lead tetraacetate which reacts as rapidly as it is formed with compounds containing the alpha-glycol groups to split the chain at points between the two adjacent carbons to which the hydroxyl groups are attached, yielding the aldehydes.

Specific examples show production of pelargonic aldehyde and the half aldehyde of azelaic acid from oleic acid and alpha-nonenaldehyde from castor oil.

For modifications of this process, see Patent No. 2,304,064 (A), issued on December 8, 1942, (same title and inventors).

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PROCESS FOR PRODUCING FATTY ACID POLYHYDRIC ESTERS FROM GLYCERIDES

Patent No. 2,290,609 (A) Patent Date: July 21, 1942
Inventors: Warren H. Goss and Henry Fraser

This invention provides a method for converting mixtures of fatty acids occurring in nature as glycerides, in products such as oils of soybean, linseed, cottonseed, tung, castor, rapeseed, and similar oils, into separated polyhydric fatty acid esters.

In accordance with the invention, the glycerides are converted into monoesters or diesters in accordance with any of the known methods. Alcoholysis is given as an example. This alters the mixed condition in which the fatty acids occur in nature and permits efficient separation.

In accordance with the preferred procedure, the alcohol is then separated out. Where feasible, this may be done by washing with water.

The esters are subjected then to selective solvent fractionation. Intermediate fractional distillation may be employed. The selective solvent fractionation is carried out in such a manner that the esters are distributed between incompletely miscible liquid phases, which are separated. These separated phases are then subjected to catalytic alcoholysis using polyhydric alcohols to produce the corresponding polyhydric fatty acid esters. Suitable polyhydric alcohols are glycerine, mannitol, erythritol, arabitol, sorbitol, and xylitol.

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PROCESS FOR THE PRODUCTION OF CHLORINE

Patent No. 2,309,919 (A) Patent Date: February 2, 1943

Inventor: Donald L. Reed

By the use of nitric acid, decomposition and oxidation of hydrogen chloride, nitrosyl chloride, and mixtures thereof are effected to form chlorine and nitrogen peroxide.

In accordance with the present invention, this reaction is accomplished with greater ease and lower temperature (40° to 160° C.) than were heretofore possible by the use of a siliceous adsorbent, such as silica gel, as a catalyst and an agent that absorbs some of the gaseous products of the reaction, namely, nitrogen peroxide and water vapor, and permits partial separation from each other.

The catalyst can be regenerated by heating to at least 400° C., whereupon the adsorbed gas is given off and recovered.

(See also Patent No. 2,240,668 (A), p. 90).

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SULPHYDRYL COMPOUND OBTAINED FROM FLOUR

Patent No. 2,313,504 (A) Patent Date: March 9, 1943

Inventors: Arnold K. Balls and Walter S. Hale

This invention provides a method for obtaining from grain flours, such as wheat, rye, corn, oat, malt, lima bean, cottonseed-meal, and peanut flour, sulphydryl-bearing compounds which are useful in medicine and industry due to their chemical reactivity, particularly their property of forming or entering into oxidation-reduction systems. They are especially useful as substitutes for cystine and cysteine.

The process involves extraction of the flour with petroleum ether, then removing the solvent by distillation or evaporation. The resulting residue is dissolved in ether, and the sulphydryl-bearing fraction is finely precipitated from the solution with an agent such as acetone, ethyl acetate, or slightly acidulated ethyl alcohol, the latter giving a precipitate that is nearly lipoid and fat free and can be made wholly so by washing with alcohol and ether.

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PREPARATION OF TETRA-CARBOXYLIC DI-ANHYDRIDES

Patent No. 2,329,979 (A) Patent Date: September 21, 1943

Inventor: Lewis W. Butz

This invention is based on the discovery that organic compounds belonging to the class of 1,5-diene-3-ynes react with two moles of maleic anhydride to form stable addition products which contain two carbon rings more than are contained in the dieneyne employed as a starting material. This procedure makes it possible to synthesize steroids of the non-benzenoid type as well as non-steroid types of polycyclic compounds which are indicated as having application as intermediates in the synthesis of various therapeutic compounds.

Specific compounds covered by the claims are:

1,5-dimethylhexahydronaphthalene-3,4,7,8-tetracarboxylic-3,4;7,8-dianhydride;
Steradiene-6,7,11,12-tetracarboxylic-6,7;11,12-dianhydride;
Tetradecahydrochrysene-5,6,11,12-tetracarboxylic-5,6;11,12-dianhydride.

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METHOD FOR THE PURIFICATION OF LACTIC ACID

Patent No. 2,331,948 (A) Patent Date: October 19, 1943

Inventors: George E. Ward and Benjamin Tabenkin

This invention is a process for obtaining lactic acid in either the racemic or optically active form from impure racemic or optically active lactate containing liquors in such a way that certain undesirable material is eliminated to yield a water-white lactic acid of high purity. Sulfuric acid is employed in the process.

Commercial purification of lactic acid has been a difficult problem due to the fact that it is not readily volatilized, does not form salts of extremely low solubility, and is difficult to convert to esters which might be used as purification intermediates. Recrystallization of calcium lactate from water, as commercially practiced for this purpose, is troublesome and often unsatisfactory.

In accordance with the invention, lactic acid in the form of zinc lactate is reacted with sulfuric acid. This results in the formation of zinc sulfate which is insoluble in the reaction mass, leaving in solution substantially pure lactic acid. The zinc sulfate is separated out and can be added to fermentation liquors or crude lactate liquors containing calcium lactate to obtain more zinc lactate. Thus, the process can be made cyclic as to the zinc, except for small losses. The only byproduct is calcium sulfate.

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PROCESS FOR THE PRODUCTION OF ACONITIC ACID

Patent No. 2,345,079 (A) Patent Date: March 28, 1944

Inventors: Emil K. Ventre, Herbert C. Henry and Fred L. Gayle

The invention is a process for producing aconitic acid by reacting alkaline earth aconitate in the presence of water with a mineral acid, such as sulfuric acid, under specific conditions.

The reaction results in the formation of a non-soluble alkaline earth metallic salt which is filtered out leaving aconitic acid in solution. From this solution, the aconitic acid is recovered by a process of crystallization.

Alkaline earth aconitates occur naturally in certain plant juices, such as sorgo, cane and beet.

See also Patent No. 2,359,537 (Emil K. Ventre, Joseph A. Ambler, Sam Byall and Herbert C. Henry, Inventors), issued October 3, 1944, for Process for the Extraction of Aconitic Acid from Plant Juices.

* * * * * *

MANUFACTURE OF ALICYCLIC COMPOUNDS

Patent No. 2,349,232 (A) Patent Date: May 16, 1944

Inventor: Lloyd M. Joshel

Various alicyclic compounds may be manufactured in accordance with this invention by reacting ethylene with a conjugated diene (1,3-diene) under the action of heat and pressure. The reaction proceeds by the 1,4 addition of the ethylene to the diene.

Temperatures of about 300° C. and pressures above 1000 lbs./sq. in. are used.

As specific examples, cyclopento-diene and ethylene may be reacted to produce bicyclo (2.2.1)-2-heptene; 1-methyl-1,3-butadiene and ethylene produce 1-methylcyclohexene; 1,4-diphenyl-1,3-butadiene and ethylene produce 3,6-diphenylcyclohexene; and 2-chloro-1,3-butadiene and ethylene produce 1-chlorocyclohexene.

Other examples are given in the patent.

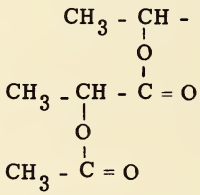
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ESTERS OF ACETYLLACTYLLACTIC ACID AND PROCESS FOR MAKING SAME

Patent No. 2,350,388 (D) Patent Date: June 6, 1944

Inventor: Houston V. Claborn

This invention relates to compounds having the formula



where R is an alkyl or substituted alkyl group. These compounds are colorless, odorless liquids of low vapor pressures. They are slightly soluble in water and completely miscible with benzene. They are good plasticizers, expecially for cellulose derivatives and good solvents, especially for synthetic resins.

These compounds may be formed by reacting esters of lactyllactic acid with an acetylating agent, such as ketone or acetic anhydride, in the presence of an acetylating catalyst, such as sulfuric acid.

Specific compounds covered by the examples and claims are ethyl, methyl, and n-butyl acetyllactyllactate. Another one covered by an example is beta-acetoxyethyl acetyllactyllactate.

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METHOD OF PREPARING TRANS-QUINITOL DIACETATE

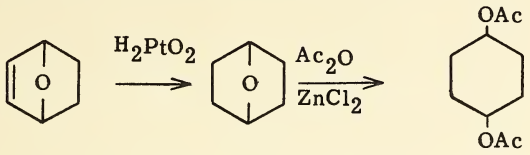
Patent No. 2,377,571 (A) Patent Date: June 5, 1945

Inventor: Walter Nudenberg

In accordance with this invention, trans-quinitol diacetate is prepared from 3,6-epoxycyclohexene by hydrogenating the latter, followed by fission of the ether linkage with acetic anhydride.

The hydrogenation is catalyzed, in the example given, with platinum dioxide. Fission of the ether linkage is assisted by the presence of zinc chloride crystals.

The two-step reaction is represented as follows:



Ac being acetyl.

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PROCESS FOR MANUFACTURING ACRYLIC ESTERS AND OTHER UNSATURATED COMPOUNDS BY THERMAL DECOMPOSITION

Patent No. 2,378,501 (A) Patent Date: June 19, 1945

Inventors: William P. Ratchford and Charles H. Fisher

In the production of various saturated compounds by thermal decomposition, such as the production of methyl acrylate from methyl alpha-acetoxypropionate, steel and iron tubes are usually employed for the pyrolysis chambers since they are more readily available. However, these materials catalyze the formation of undesired by-products, chiefly gases and carbonaceous materials, during the pyrolysis.

In accordance with this invention, this deleterious effect is decreased by the use of inhibitors, such as oxygen, sulfur and nitrogen compounds, which diminish or destroy the catalytic activity.

The pyrolysis tube may be either pretreated with the inhibitor or the inhibitor may be mixed with the material to be pyrolyzed prior to the pyrolysis.

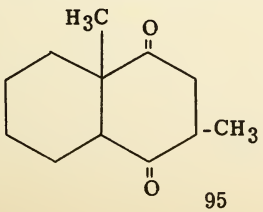
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COMPOSITION OF MATTER

Patent No. 2,379,494 (A) Patent Date: July 3, 1945

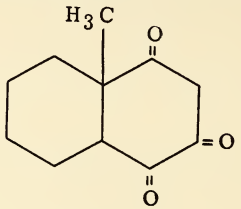
Inventors: Milton Orchin and Lewis W. Butz

This patent covers the new compound 2-methoxy-5-methyl-2,7-naphthitadiene-1,4-dione, having the structural formula



as an intermediate in the synthesis of polycyclic compounds. It also covers a method of making this compound as the adduct resulting from the reaction of 5-methoxy-2-methyl-1,4-benzoquinone and butadiene.

The adduct may be hydrolized to obtain 5-methyl-7-naphthitene-1,2,4,-trione enol having the following formula:



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BETA-CHLOROALLYL ACRYLATES

Patent No. 2,388,440 (A) Patent Date: November 6, 1945

Inventors: Chessie E. Rehberg and Charles H. Fisher

The invention covered by this patent is a process for producing beta-chloroallyl acrylates from the corresponding esters of the type

$$CH_3.CR_2(OCO\cdot CH_3)\cdot COO\cdot CH_2CCl{:}CH_2$$

where R_2 is hydrogen or methyl. This conversion is effected by pyrolysis. The pyrolysis tube may be packed with suitable contact material, such as quartz chips. Suggested range of pyrolysis temperature is 400° to 600° C.

Specific esters claimed for conversion to the corresponding acrylates are the beta-chloroallyl esters of alpha-acetoxy isobutyric and propionic acids.

* * * * * *

ALLYL AND SUBSTITUTED ALLYL METHACRYLATES

Patent No. 2,390,326 (A) Patent Date: December 4, 1945

Inventors: Chessie E. Rehberg and Charles H. Fisher

This invention provides a method of manufacturing allyl methacrylate and substituted allyl methacrylates, such as beta-methylallyl methacrylate, of relatively high molecular weight and low vapor pressure.

These compounds are useful with other unsaturated monomers to prepare interpolymers of any desired degree of cross-linkage, hardness and insolubility, due to the presence of two, rather than one olefinic linkage as in the case of other monomers, such as the alkyl methacrylates.

The process of the invention comprises transforming the allyl or substituted allyl alpha-acetoxy-isobutyrates to the corresponding methacrylates by passing it through a pyrolysis tube at a temperature of 400° to 600° C. The tube may be packed with quartz chips or similar contact material.

See also Patent No. 2,390,327 (A) (same inventors), issued December 4, 1945, entitled Allyl and Substituted Allyl Acrylates, whereby a similar process is disclosed for preparing the title compounds by pyrolyzing allyl or substituted alpha-acetoxypropionates at 400° to 600° C.

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PRODUCTS OF PROTEINS AND STARCHES

PROCESS FOR THE MANUFACTURE OF STARCHES

Patent No. 2,001,925 (D) Patent Date: May 21, 1935
Inventor: Francis H. Thurber

Alkaline sulphite solutions or other alkaline reducing agents, such as sodium sulphide solution, are used for removing colored compounds of the raw materials from which starch is made. The process is illustrated with respect to sweet potatoes as the raw material from which sweet potato starch is made.

See also, by the same inventor, Patent No. 2,149,802 (D), issued March 7, 1939, entitled Process for the Extraction of Root Starches, and Patent No. 2,119,612 (D), issued June 7, 1938, entitled Form of Storage for Sweet Potatoes and Other Vegetable Crops for Industrial Utilization.

* * * * * *

METHOD FOR THE PREPARATION OF ADHESIVES FROM STARCHY VEGETABLE MATTER

Patent No. 2,124,994 (D) Patent Date: July 26, 1938
Inventors: Howard S. Paine and Kyle Ward, Jr.

This invention provides a process for making adhesives from starchy vegetables, such as sweet potatoes, in such a manner that the non-starchy constituents do not interfere with the use of the product.

In accordance with one embodiment of the invention, the starchy vegetable is first treated with sulfur dioxide gas or gasoline vapors. It is then pressed to remove water and other constituents, then dried and ground to a powder. This powder is then converted to an adhesive by treating it with a starch converting agent.

Other embodiments of the invention are illustrated by specific examples.

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FIBER

Patent No. 2,140,274 (D)* Patent Date: December 13, 1938
Inventors: Earle O. Whittier and Stephen P. Gould

This is one of a series of patents on inventions by these inventors involving the manufacture of wool-like fibers from casein. Casein is the basic ingredient in all these inventions, but the different patents cover the use of varying modifying agents or methods for producing such fibers with different characteristics.

In this particular case, the final fiber contains casein, salts of casein, such as aluminum, and fat acids.

* Note: This patent was involved in an interference, the result of which was that priority to the first claim, directed broadly to salts of casein, was awarded to an opposing party, while priority as to the second claim, which is specific to aluminum salts of casein, was awarded to these inventors.

The fiber is made by dispersing the casein and fat acids in water or alcohol solutions of a suitable solvent, such as sodium hydroxide and ammonium hydroxide. To this is added a compound such as sodium aluminate to form the corresponding casein salt, such as casein aluminate. This solution is then extruded through very fine holes, such as those used for making rayon, called spinerettes, into a solution called the precipitating bath which precipitates the first solution as it passes through the spinerettes in long continuous threads. These threads are then hardened and treated further to make them suitable for commercial use.

Other related patents of this series are: Nos. 2,167,202; 2,169,690; 2,204,535; 2,225,198; 2,204,336; 2,197,246; and 2,187,534. All these patents are dedicated to the public.

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LOW VISCOSITY STARCH ADHESIVE AND METHOD OF PREPARING THE SAME

Patent No. 2,202,678 (D) Patent Date: May 28, 1940
Inventor: Kyle Ward, Jr.

Previous methods for preparing adhesives from starch or starchy materials by the use of inorganic alkalies do not produce a satisfactory product. Also, they do not dispense with the undesirable effects due to the presence of cellulosic fibers normally present in starchy materials, such as sweet potato flour or starch, or corn starch. These fibers swell and in the swollen state have an undesirable effect on the finished product making it less effective as an adhesive.

In accordance with this invention, the adhesive is produced by converting the starch or starchy materials by means of an organic onium base, instead of an inorganic alkali. This results in an adhesive of low viscosity and dissolves cellulosic fibers to produce a more homogenous product.

Suitable organic onium bases indicated are ammonium, sulfonium, and phosphorum. Specific examples are given using trimethylbenzylammonium hydroxide and tetramethylammonium hydroxide.

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PROCESS FOR PROTECTING MATERIALS OF KERATIN COMPOSITION

Patent No. 2,204,360 (D) Patent Date: June 11, 1940
Inventors: Harry Humfeld, James H. Kettering, and Ruth E. Elmquist

This invention provides a method for sterilizing and disinfecting textile and other fibrous materials of protein composition, such as wool, mohair, bristle, horse-hair, silk, shoddy, etc.

The method comprises heating the material at a temperature in the range of 212° to 275° F. for about 12 to 1 hours while holding it immersed in Stoddard solvent.

The method is particularly useful in sterilizing such materials against animal borne infectious diseases.

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AQUEOUS DISPERSION OF HARDENED PROTEIN

Patent No. 2,210,481 (A) Patent Date: August 6, 1940

Inventors: George H. Brother and Allan K. Smith

This invention provides protein dispersions that dry to waterproof films. Protein films are known to have high strength and in this respect are good adhesives and coatings. However, they are readily affected by water, and numerous attempts have been made to remedy this weakness.

In accordance with this invention, the protein material, either vegetable or animal, is dispersed in an aqueous solution of hardening or tanning agents, such as aldehydes, ketones, chromium salts, and so forth, and adjusted to a suitable pH. A salt may be used to aid in the dispersion. In prior methods, the hardening agent was added to a solution of the protein which caused thickening, gelling, or coagulation. The presence of sodium salicylate, sodium carbonate, trisodium phosphate, sodium tetraborate, and calcium chloride produces increased dispersion of the protein.

See also Patent No. 2,380,020 (A) dated July 10, 1945 (same inventors) entitled Aqueous Dispersions of Hardened or Tanned Protein Salts covering stable aqueous dispersions of hardened protein salts, such as of soybean or casein comprising about 9% partially hydrolized salt and formaldehyde, the latter being present in about 4% excess. A pH in the range of 5.7 to 7.5 is favorable to the stability of the dispersion and improves the water resistance of films or coatings made from the dispersions.

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THERMOPLASTIC PROTEIN MATERIAL

Patent No. 2,238,307 (A) Patent Date: April 15, 1941

Inventors: George H. Brother and Leonard L. McKinney

By means of this invention, a thermoplastic material may be made from proteins and a hardening agent so that it can be molded without the use of a plasticizer.

In accordance with the invention, a protein material, such as soybean, cottonseed, and linseed protein or meal, zein, gluten, other vegetable protein material or casein from milk, is treated with an aldehyde or similar hardening agent, such as chromium and aluminum salts, at a pH between 7.0 and the isoelectric point of the protein. The reaction product is then air dried to a moisture content of 10 to 12%. This material molds readily and comes finished as regards stability, finish, etc. from the die. It is completely thermoplastic so that any fins or rejects may be returned to the die and remolded.

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THIXOTROPIC COMPOSITION OF MATTER

Patent No. 2,277,048 (D) Patent Date: March 24, 1942

Inventor: Martin Leatherman

The object of the invention is to prepare concentrated aqueous emulsions of precipitated resins which may be easily dispersed in water and which, upon evaporation of the water, will leave adherent films. Such films are particularly useful in conjunction with plant sprays to increase the resistance of the spray materials to weather conditions.

In accordance with this invention, an aqueous ammonium proteinate solution is prepared by dispersing any suitable protein, such as casein, soybean protein, peanut protein, gelatin, and so forth, in dilute ammonium solution. Any water insoluble resinate or mixture, such as those of copper, zinc, silver, calcium, manganese, cobalt, and so forth, is then wetted with aqueous ammonium proteinate solution by gradually adding the two together and violently agitating the mixture. Enough resinate is added until the total amount is about 97 percent of the weight of water used in preparing the proteinate solution. Then, an aqueous suspension of hydrated lime or magnesia is blended into the mass in an amount at least chemically equivalent to the ammonia employed, but not in excess of twice this equivalent amount. The resulting composition is characteristically thixotropic.

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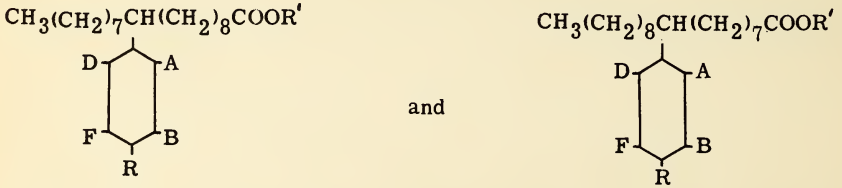
WETTING AGENT

Patent No. 2,302,070 (A) Patent Date: November 17, 1942

Inventors: Alexander J. Stirton, Robert F. Peterson and Philip H. Groggins

The invention consists of new chemical compounds useful as wetting agents, textile assistants, penetrants, surface-active agents, and so forth.

These compounds belong to the general class of sulfoarylstearic acids and esters represented by the formulae



where A, B, D, and F amy be hydrogen, an alkyl group, or the group $-SO_3H$; R may be $-SO_3H$ or a para-orienting radical, such as phenoxy, phenyl, methyl, chloro, bromo, methoxy, ethoxy or a substituted phenyl or phenoxy radical in which one or more hydrogen atoms have been replaced by $-SO_3H$. A, B, D, F and R are such that at least one of them represents or contains the group $-SO_3H$. R' may be hydrogen or an alkyl group.

Specific examples of such compounds covered by the claims are: Sulfotolylstearic acid, sulfoethylphenylstearic acid, and sulfoxylylstearate.

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PROCESS FOR PRODUCING PROTEIN PLASTICS

Patent No. 2,309,380 (A) Patent Date: January 26, 1943

Inventors: George H. Brother and Leonard L. McKinney

This invention provides a process for plasticizing hardened, thermoplastic protein material, so that finished molded pieces may be made therefrom of different degrees of rigidity. The use of water as a necessary plasticizer is eliminated due to objectionable properties resulting from its use.

In accordance with the invention, a protein material, such as soybean protein or meal, cottonseed protein or meal, zein, gluten or other vegetable protein material, or casein from milk, is treated with a hardening agent,

such as formaldehyde, aldehyde, acetaldehyde, crotonaldehyde, propionaldehyde, etc., to produce and carry to completion the hardening, curing, or tanning reaction. This product is then dried, ground, and mixed with an agent which will react upon the protein to produce first a soft, well-plasticized material when heated, but which upon continued heating sets and is no longer thermoplastic. Suitable agents for this purpose are polyhydric alcohols, such as ethylene glycol, diethylene glycol, propylene glycol, glycerol, sorbitol, mannitol; unsaturated alcohols, such as allyl alcohol, furfural alcohol; ethers of polyhydric alcohols, such as methyl and ethyl ethers of ethylene and diethylene glycols: nitriles, such as ethylene cyanhydrin, etc.

See also Patent No. 2,262,422 (A) issued on November 11, 1941 (same inventors) for Protein Plastic Molding Compound and Method of Preparing Same, wherein a resin or resinous material, such as a phenolic- or a urea-formaldehyde resin, or a polyhydric alcohol polycarboxylic acid resin, is ground together and mixed with the hardened protein to obtain a water-resisting protein molding powder.

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PROTEINOUS COMPOSITIONS AND THEIR PROCESS OF PRODUCTION
Patent No. 2,344,267(A) Patent Date: March 14, 1944
Inventor: Henry C. Reitz

New proteinous compounds are produced in accordance with the invention containing sulfur in excess of 2% by reacting protein, such as wheat gluten and casein, with chlorosulfonic acid in the presence of a tertiary amine, such as pyridine and triethylamine.

The claims cover both process and products obtainable by the process.

The products have the property of absorbing large quantities of water and yield colorless, odorless and tasteless gels. They are indicated as being useful as substitutes for natural gums, such as gum tragacanth, as emulsifying agents, and for use as surgical dressings.

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PROCESS FOR EXTRACTING PROLAMINES
Patent No. 2,354,393 (A) Patent Date: July 25, 1944
Inventors: Ralph H. Manley and Cyril D. Evans

The invention provides a process for extracting prolamines from vegetable material, such as zein from corn gluten and gliadin from wheat gluten, without danger of gelation during extraction and subsequent processing.

The prolamine containing material is mixed with an aldehyde and a prolamine dispersing agent, such as methyl, ethyl, propyl and other aliphatic alcohols, acetone and other aliphatic ketones, organic oxides, such as dioxane, lower glycols, such as ethylene glycol, lower glycol esters, such as methyl and ethyl cellosolve and carbitol. Other suitable dispersing agents may be used, but ethyl and isopropyl alcohols are preferred.

A suitable aldehyde is one that is miscible with other components of the mixture.

The mixture is agitated and heated at a temperature of about 120° C. for about 15 to 30 minutes. This stabilizes the reaction before the protein

has time to gel. The material is then filtered and the filtrate recovered, which will resist gelation for many months at room temperature.

Many of these filtrates also can be made into clear, smooth water-resistant films when applied to paper, glass and other surfaces.

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PROTEIN PRODUCT AND PROCESS FOR MAKING SAME
Patent No. 2,370,266 (A) Patent Date: February 27, 1945
Inventors: Allan K. Smith, Herbert J. Max and Donald H. Wheeler

To increase the whiteness of paper coating materials containing clay and proteins, such as casein or soybean protein, an alkali dispersion of the clay and protein is treated with a dithionite salt, such as sodium hydrosulfate and zinc hydrosulfite.

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FIRE-RETARDING COATING
Patent No. 2,378,865 (D) Patent Date: October 30, 1945
Inventor: Arthur Van Kleeck

This invention provides a preparation for application to combustible materials, such as wood, to increase its fire resistance.

Its advantage lies in the fact that only one or two coatings are necessary to obtain good protection in contrast to previous preparations requiring many coatings.

The composition comprises generally an aqueous solution of an alkali alginate in which is incorporated fire-retarding ingredients, such as borax and boric acid. Other ingredients may be added to improve the physical quality of the composition, such as China clay and bentonite, wetting agents, corrosive preventatives, coloring agents, etc. Decay and mold preventatives may also be added.

The composition is especially useful for interior application and is of limited value for exterior application due to the water solubility of the alginate.

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OTHER CHEMICAL PROCEDURES

PROCESS OF INDUCING UNIFORMITY OF BLOOMING AND FRUIT PRODUCTION IN FRUITING PLANTS

Patent No. 2,084,461 (A) Patent Date: June 22, 1937
Inventors: Daniel Glenn Sorber and Marston Henchman Kimball

In various parts of the country, there are large areas of fruiting plants, such as walnuts, peaches, apples, pears, apricots, plums, prunes, cherries, bush berries, and so forth, where weather conditions in some years are unfavorable to the formation of flowers, the setting of fruit, and the production of a crop. This results in failure of plants to produce regular crops, occasioning heavy losses. Also certain fruits, such as lemons are subject to rest periods between growth cycles or alternate bearing habits, such as the avocado, and climatic conditions may be such as to affect their coming out of the rest period.

The object of the present invention is to overcome these deficiencies by stimulating plant growth.

In accordance with the invention, the plants are treated with an unsaturated hydrocarbon gas, such as butylene gas. The plants are enclosed in a tent or other similar enclosure and the gas introduced at a concentration of from 1 part in 100 to 1 part in 100,000 for between 1 to 24 hours, depending on temperature, leakage of gas, and other conditions. Temperatures of 60° to 100° F. are recommended. The treatment should be applied 2 to 6 weeks before the desired leafing out, start of the growth cycle, or blooming time.

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ALKALOID COMPOUND

Patent No. 2,139,839 (D) Patent Date: December 13, 1938
Inventor: Robert S. McKinney

This invention provides new compounds that are formed by the reaction of fatty acids of drying oils, such as tung, linseed , fish, and soybean oils, with vegetable alkaloids, such as nicotine, quinine and strychnine.

In general, these compounds are non-volatile, heavy, viscous, sticky fluids, insoluble in water, but soluble in alcohol.

The nicotine-fatty acid compounds are useful as insecticides; the strychnine-fatty acids may be used as a poison for predatory animals and in medicine; and the quinine compound is useful as an ingredient in anti-sunburn ointment due to its ability to prevent absorption of most of the ultraviolet rays.

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PROCESS OF TREATING OILS

Patent No. 2,185,414 (D) Patent Date: January 2, 1940
Inventor: Robert S. McKinney

Drying properties of weak drying oils, such as soybean oil, safflower oil and linseed oil, and semi-drying oils, such as cottonseed oil, corn oil, and kapok oil, are increased by heating them at a temperature of 200° to 250° C.

for between 2 and 18 hours with small amounts (about 0.1%) of alkali hydroxides, such as sodium, potassium and lithium hydroxide, oxides, hydroxides or fatty acid salts of the alkaline earths, such as barium, calcium and magnesium oxide or hydroxide, and calcium linolenate, barium linoleate and magnesium oleate.

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PROCESS FOR FRACTIONATING RESINOUS PRODUCTS

Patent No. 2,189,572 (D) Patent Date: February 6, 1940
Inventor: Paul D. Watson

Resins made from lactic acid ordinarily require a considerable period in order to cure them to a hard, water and alcohol resistant material.

This invention overcomes this difficulty by separating the more highly polymerized fraction from the lower molecular weight fraction of the resin, thereby permitting a more rapid curing of the former and increasing its hardness and insolubility.

A resin prepared by adding to dehydrated lactic acid a small portion of a hardening agent, such as glycerol, furfural, lactose, etc., and partially curing by baking at about 150° C. may be dissolved in acetone, benzene or a mixture of the two. By adding to this solution an aliphatic hydrocarbon derived from petroleum oil, such as Skellysolve (H) B.P. 69-96° C., Solvesso #3, B.P. 185-216° C., petroleum ether B.P. 30-65° C., heptane B.P. 90-100° C., or terpenes, such as turpentine and cymene, the darker, hard portion of the resin precipitates, while the lighter-colored, soft portion remains in solution. The precipitated portion can be readily separated and cured with heat (about 150° C.).

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PROCESS FOR DETERMINING THE ALKALOID CONTENT OF UNCURED TOBACCO

Patent No. 2,260,677 (A) Patent Date: October 28, 1941
Inventor: Louis N. Markwood

The object of this invention is to enable tobacco growers and breeders to ascertain the alkaloid (essentially nicotine) content of tobacco plants while they are still living in the soil in order to make proper selections. Prior methods required harvesting of the entire plant, followed by drying or curing and grinding before an analysis could be made. Such procedure is obviated by this invention, which is a short process, accurate, and requires only a small portion of the green leaf for test (about a 20 mm. disc).

The green leaf sample is first digested with sulfuric acid. The resulting extracts are recovered and reacted with lead oxide in an amount sufficient to precipitate the proteins from the extract and neutralize the mother liquor, the latter being separated from the precipitate. Any lead ions remaining in the liquor are removed by adding an element more electropositive than lead, such as magnesium, aluminum, zinc, and iron. This precipitates the lead which is removed. Any suitable method for estimating the tobacco alkaloid content of a solution may then be used, such as the turbidimetric (adding phosphotungstic acid) or the colorimetric method. The latter measures the orange or red color produced by addition of a halogen cyanide and an amine.

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PROCESS FOR THE PREPARATION OF TUNG OIL

Patent No. 2,277,342 (D) Patent Date: March 24, 1942

Inventors: Robert S. McKinney, William Gordon Rose and Andrew F. Freeman

The usual methods of solvent-extracting tung oil result in a product that, although initially clear, soon forms a solid which upon standing becomes insoluble and infusible. This material cannot be used in making varnish and is, therefore, not acceptable to the tung oil trade.

The object of the invention is the provision of a method by which a clear, liquid, solvent-extracted tung oil can be obtained from tung kernels and tung oil press cake.

Essentially the process of the invention comprises extracting the tung oil, using a counter-current system, with petroleum ether. The solvent is then removed by distillation or other suitable means. The solvent-free tung oil is then heated at 200° C. or higher for about 30 minutes to yield a clear oil that is a liquid at room temperatures.

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COTTON YARN FOR WATER-PRESSURE HOSE

Patent No. 2,352,707 (A) Patent Date: July 4, 1944

Inventor: Charles F. Goldthwait

Cotton yarn that has been impregnated with one of the ethers of cellulose, such as hydroxy ethyl cellulose, then washed and dried under tension, is woven into fabric and used as a water-holding wall of a hose. The cellulose derivative swells when wetted and renders the hose waterproof.

Drying of the yarn under tension causes a permanent set, which renders the hose substantially non-expansible.

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COATING MATERIALS AND PROCESS FOR MAKING THEM

Patent No. 2,363,103 (A) Patent Date: November 21, 1944

Inventor: Paul D. Watson

This invention provides a material that can be used as a coating on metal surfaces. It is useful as a substitute for tin coatings on so-called "tin cans" and for other metals.

The material is made by heating a mixture of polylactylic acids (a milk product) and a fatty drying oil, such as corn oil, soya bean oil, castor oil, and so forth, in the presence of a catalyst until it becomes resinified to a soft and elastic material. This material is then applied to the surface of the metal, such as by a solvent, and baked in an oven. No primer is necessary, although a preliminary hot dip phosphate treatment is recommended.

Suitable catalysts indicated are activated bauxite, cobalt salts, ferric oxide, chromic oxide, ferrous lactate, powdered iron, aluminum powder, magnesium turnings, magnesium methoxide, vanadium pentoxide, and cobalt oxide.

Other suitable drying oils are linseed oil, tung oil, dehydrated castor oil, oiticica oil, and Perilla oil.

A better product is obtained if the mixture, upon heating, also contains a material such as fumaric acid or maleic anhydride.

The coating is hard and tough and does not taste-contaminate food. It is non-toxic, adherent, flexible and resistant to water, steam, alcohol, acids and weak alkali.

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PROCESS FOR PRODUCING POLYMERIC MATERIALS
Patent No. 2,373,015 (A) Patent Date: April 3, 1945
Inventors: John C. Cowan and Waldo C. Ault

This is a method for producing high polymers having rubber-like properties. Polymers produced in accordance with this invention are commonly referred to as Norepol. (The process was developed at the Northern Regional Research Laboratory. Hence the name is a combination of the words Northern Regional Polymer.)

In its broadest aspect, the invention comprises vulcanizing dihydric alcohol polyesters of polymeric acids derived from monomers containing unsaturated acyl radicals containing at least two double bonds.

Compounds containing radicals of unsaturated fat acids, such as the free acids, their glycerides or esters, are first converted to the polymeric acids with monohydric alcohols. Examples of such unsaturated compounds are corn oil, tung oil, linseed oil, cottonseed oil, soybean oil, sunflower seed oil, and dehydrated castor oil.

A number of methods for effecting this conversion are explained. One method is to subject the fatty oil to alcoholysis with monohydric alcohols, such as methanol or ethanol to connect the glycerides of the unsaturated acids to the corresponding esters. These monoesters are then polymerized and the free polymeric acids obtained by hydrolysis.

The polymeric acids obtained are then reacted with dihydric alcohols, such as ethylene glycol or diethylene glycol. The reaction product may then be converted to plastic rubber-like products by vulcanization, that is, by reacting them with sulfur, tellurium, selenium, or other vulcanizing or oxidizing agents.

An improvement on the above invention is covered in Patent No. 2,384,443 (A), issued September 11, 1945 (John C. Cowan and Howard M. Teeter, inventors) entitled Plastic Composition and Method of Preparing Same, wherein it is pointed out that many of the products made in accordance with Patent No. 2,373,015 have a high viscosity and pronounced tackiness causing them to adhere tenaciously to mechanical devices commonly used in processing rubber compositions. They cannot, for example, be milled into sheets or extruded through dies or into molds and frequently yield defective foraminous products upon vulcanization.

In the natural rubber industry, milling is usually accomplished prior to vulcanization. This procedure is reversed in the present invention. Vulcanization agents are first added. This is followed by a heat treatment until the mixture becomes millable. It is then plasticized by milling.

This results in a product having properties approximating those of natural rubber.

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TREATMENT OF OILSEEDS

Patent No. 2,376,852 (A) Patent Date: May 22, 1945
Inventors: Aaron M. Altschul and Melvin L. Karon

Oilseeds, such as cottonseed and soybeans, when stored for long periods of time undergo certain chemical changes which result in their deterioration. This is the result of the activity of enzyme systems in the seeds which becomes accelerated with increased moisture content.

This invention provides a method of overcoming this difficulty by treating the oilseeds with a volatile base such as ammonia to increase their pH (normally about 6.50 to 7.00) to above 8. The range of 8 to 8.5 is suggested, although the upper limit is not critical.

When treated in this way, the seeds do not heat at all, and the color of the resulting oil is lighter than the original color of the untreated seed. The treatment inhibits the natural deteriorative processes in the seed and prevents the growth of molds on moist cottonseed. It not only prevents darkening of the color of oils in the seed, but reduces the dark color of oils generally.

See also companion Patent No. 2,376,568 (A), covering the use of morpholine instead of ammonia for the same purpose.

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METHOD OF PRODUCING SURGICAL BANDAGES WITH IMPROVED ELASTIC PROPERTIES

Patent No. 2,379,574 (A) Patent Date: July 3, 1945
Inventor: Charles F. Goldthwait

Conventional surgical bandages made from bleached cotton gauze (cheese cloth) are very difficult to fit and keep in position on various parts of the body because they are inelastic and unstrechable. They also limit the freedom of movement of parts of the body at joints. There are other disadvantages to the usual type of gauze bandage which the present invention overcomes by providing such a bandage that is roughened and elastic both lengthwise and crosswise.

This result is obtained by treating an open weave cotton fabric with a sodium hydroxide solution of 20 to 25% concentration without applying tension to the fabric. This causes the yarn of the fabric to shrink and develop small crimps. The sodium hydroxide is then removed and the fabric dried in a non-tensioned state.

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PROCESS FOR THE PREPARATION OF MYOSMINE

Patent No. 2,381,328 (A) Patent Date: August 7, 1945
Inventors: Charles F. Woodward, Abner Eisner and Paul G. Haines

Myosmine is an alkaloid which is believed to be responsible, wholly or in part, for the aroma of tobacco smoke. It was previously obtained, but only in minute quantities, from tobacco smoke.

This invention is a process for obtaining this alkaloid in much greater quantities from nicotine, thereby permitting its use as an adjunct to tobacco to impart a characteristic aromatic flavor.

The process is carried out by passing the vapor of substantially pure nicotine over silica gel or fused quartz at a temperature of about 500° to 650° C. The resulting treated vapor, containing myosmine, may be condensed and the myosmine recovered from it by distillation.

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PROCESS FOR THE COAGULATION OF CASTILLOA LATEX
Patent No. 2,390,996 (A) Patent Date: December 18, 1945
Inventor: Tirey Foster Ford

Castilloa latex, a source of natural rubber, is difficult to coagulate due to its normal stability in acids. Primitive methods used for coagulating this latex are generally unsatisfactory due to the uncertainties and difficulties involved which has retarded commercial development of Castilloa rubber.

The invention covered by this patent is a simple method for effecting coagulation of this latex. In accordance with the method, the latex is first treated with an alkaline substance, such as ammonium hydroxide and then with an acid substance, such as hydrochloric acid, in an amount sufficient to neutralize the ammonium hydroxide. Heat is also added to facilitate the coagulation.

The claims cover specific proportions of ingredients: 15 parts latex to 1/3 to 1 part of ammonium hydroxide.

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MEASURING AND TESTING DEVICES

FRUIT TESTING DEVICE

Patent No. 2,003,749 (D) Patent Date: June 4, 1935
Inventor: Ausker E. Hughes

This is an elaborate mechanical testing apparatus for applying external pressure to certain whole fruits and for measuring the pressure required to rupture them. It also includes means for measuring the circumference of the fruit and the change in this dimension under the influence of applied external pressure.

These characteristics of fruits are valuable in determining their shipping quality.

See also Patent No. 1,887,850 (D), (Victor B. Bonney and Paul A. Clifford), issued November 15, 1932, entitled Apparatus for Testing and Measuring the Hardness and Toughness of Fruits and Vegetables.

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DEVICE FOR MEASURING FLUID VELOCITY

Patent No. 2,061,941 (D) Patent Date: November 24, 1936
Inventor: William V. Hukill

This invention provides an electrical device for determining the velocity of fluids, such as air, other gases, and liquids.

Its use is particularly indicated in cold storage rooms, refrigerator cars and other places where mechanical anemometers fail to work or give erroneous results.

Essentially, the invention is a thermocouple disposed in the moving fluid and heated by a measured amount of current. Since the voltage drop across the thermocouple depends upon the temperature, the voltage drop will be an index of the amount of heat carried away by the fluid and hence an index of its velocity.

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HAZE METER

Patent No. 2,154,374 (D) Patent Date: April 11, 1939
Inventor: George M. Byram

This is a device to determine atmospheric clearness between two points and is useful in forest fire control. It can also be used in meteorology for measuring fog, smoke, dust density, and so forth.

The instrument is in the nature of a simplified photometer that receives light from a selected landscape target through one optical system, and light from the horizon through another optical system, including a smoked glass wedge and a group of slits that are calibrated relative to the densities of interval sections of the smoked wedge. Light from these two sources is brought together to the eye of the observer through a filter (blue). One of the slits will seem to disappear and its calibration is an index of the haze between the observer and the landscape target.

COTTON SAMPLE APPARATUS

Patent No. 2,156,893 (A) Patent Date: May 2, 1939
Inventors: George E. Gaus and Gerald N. Franks

This is one of a series of inventions for obtaining cotton samples that are representative of the bulk of lint cotton delivered to a cotton bale condenser.

In this device, the lint flue that connects the cotton gin with the cotton condenser is tapped at points in helical relation, and conveyor ducts carry portions of the lint cotton at these points to a minature cotton condenser to form a small sample bat.

For other cotton sampler apparatus see:

1. Patent No. 2,144,306 (A) (George E. Gaus, inventor), issued January 17, 1939, entitled Cotton Condenser Sampling Device.

2. Patent No. 2,156,894 (A) (George E. Gaus and Victor Stedronsky, inventors), issued May 2, 1939, entitled Cotton Sampler for Cotton Condensers.

3. Patent No. 2,166,811 (A) (George E. Gaus, inventor), issued on July 18, 1939, entitled Cotton Sample Selecting Device.

4. Patent No. 2,173,071 (A) (George E. Gaus and Russel G. McWhirter, inventors), issued September 12, 1939, entitled Machine for Sampling Cotton.

5. Patent No. 2,320,544 (D) (George E. Gaus, Charles A. Bennett, and Askew G. Ross, inventors), issued June 1, 1943, entitled Cotton Sampler Apparatus.

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EYEPIECE LIGHT FILTER FOR PHOTOMETERS

Patent No. 2,171,260 (D) Patent Date: August 29, 1939
Inventor: Clifford J. Thompson

This invention incorporates in the eyepiece of a photometer a plurality of color filters, any one of which may be brought into the field of view by an external adjustment.

The filter magazine is heart-shaped and carries a plurality of filters at its widest part. It is disposed in the eyepiece casing, and one end is pivoted to the casing. The other end is movable and is provided with a slot that engages a pin connected to a rotatable eyepiece aperture disc. By rotating this disc, the magazine rocks to one side or the other bringing into view any one of the filters desired.

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CONSTANT VOLTAGE RECTIFIER CIRCUIT

Patent No. 2,201,979 (A) Patent Date: May 28, 1940
Inventor: Alfred Christie

The invention is an electrical device for use with instruments which require a constant voltage potential output under varying conditions of input current, such as is required by certain meters, a specific example being

the Tag-Heppenstall moisture meter (Patent No. 1,826,247).

The device receives alternating current, rectifies it, and delivers the rectified current under conditions approximating that of a storage battery insofar as voltage is concerned.

A rectifier tube is used having twin cathodes and twin diodes, each mutually connected on the exterior of the tube. A glow discharge tube is in parallel with the output circuit of the rectifier and a choke is in series with this output circuit between the condenser and the glow discharge tube to insure the maintenance of the glow discharge tube with a safe operating current above its extinction potential. A significant feature is the absence of any shunt or inductance between the glow discharge tube and the load of the circuit.

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MATURITY TESTING DEVICE
Patent No. 2,209,020 (A) Patent Date: July 23, 1940
Inventors: Loyde M. Billman and Alfred E. DeGroot

This invention is especially adapted to determine the maturity factor of certain food products, such as corn, particularly canned corn. It substitutes for the chewing technique previously used, which depends upon idiosyncrasies of the sampler. This human element makes such methods inaccurate and unreliable.

The device is portable and comprises a punch and die of predetermined diameter for punching out a disc from the skin or pericap of the kernel. Means are provided to measure the force required to accomplish this in each instance and to indicate this value in terms of maturity which is read directly on a dial attached to the instrument.

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DEW POINT RECORDER AND INDICATOR
Patent No. 2,240,082 (D) Patent Date: April 29, 1941
Inventor: Charles Warren Thornthwaite

The invention is a device for determining the moisture concentration of a gas by determining its dew point temperature.

In one form of the invention, the back of an ordinary mirror is placed in contact with a metal rod that is kept cold with some refrigerating means, such as a mixture of ice and alcohol. A light is directed on the mirror at an angle so that it is reflected. A photoelectric cell is placed so as to receive the reflected light. An electric heating element is also placed near the mirror and is controlled by a switch that is actuated by the photoelectric cell. When light shines on the cell, the switch is open and the heating element does not function, thereby permitting the cold rod to bring the temperature of the mirror down. Eventually, the dewpoint of the gas will be reached, and the mirror will then become fogged due to the precipitation of moisture. This will cut off reflection of light to the photoelectric cell thus causing the switch controlling the heating element to close. Heat from the heating element will raise the temperature of the mirror until the dew evaporates permitting the light to again shine on the cell and thereby open the switch. This cycle is repeated over and over again. Depending upon the concentration of moisture in the gas, the temperature at which the dew will form on

the mirror will vary. Consequently, by attaching a suitable thermometer to the mirror, the temperature can be determined and hence the dew point of the gas. An electrical thermometer may be used to make continuous recordings on a chart over any desired period of time and hence to record changes in the moisture concentration.

The instrument has many uses, such as in the field of weather forecasting, hydrology, agricultural climatology and ecology. It has commercial application in processes employing distilling or fractionating devices, such as in the manufacture of gasoline and alcohol. It may be adapted to the control of atmospheric humidity in air-conditioning systems.

See related Patent No. 2,268,785 (D) (same inventor and title) issued January 6, 1942.

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INTEGRATOR FOR CIRCULAR ORDINATES
Patent No. 2,264,910 (D) Patent Date: December 2, 1941
Inventor: Waldo H. Kliever

The invention is an instrument for integrating the area under graphs made by the pen of the type of recorders that moves in a circular arc. The fixed coordinate line of the graph paper are rectilinear for the abscissa and circular for the ordinates.

One element of the instrument is an ordinary polar planimeter, and, in effect, the instrument is an adaptation of such a planimeter to this type of integration.

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CONSISTOMETER
Patent No. 2,295,710 (D) Patent Date: September 15, 1942
Inventor: Elmer P. Bostwick

The invention is a simple and compact device for determining the consistency of various liquids and semi-liquids. Essentially, it is an elongated container divided into two compartments by a gate which can be opened instantaneously. In one compartment the material of which the consistency is sought to be determined is placed. The gate is then sprung open. The distance the material flows past the gate in a given number of seconds is an index of the consistency.

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HARDNESS TESTING TOOL
Patent No. 2,323,925 (A) Patent Date: July 13, 1943
Inventor: Lorraine J. Markwardt

This patent covers a hand tool that can be used to determine the hardness of yieldable materials, such as wood, by merely forcing a group of pins into the material. A gauge attached to the device indicates the hardness as a function of the resistance of the material to the penetration of the pins.

One form of the invention is similar in appearance to the ordinary Yankee drill. The group of pins (four) is attached to the bottom, and force

is applied at the top to press the pins in the wood against a spring tension. When a predetermined force has been applied, a trip mechanism breaks the force, and a gauge attached to the side of the device indicates the depth of penetration of the pins in terms of units of relative hardness.

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ADJUSTABLE RESISTOR FOR FLOWMETERS
Patent No. 2,344,943 (A) Patent Date: March 28, 1944
Inventor: Ernest L. Gooden

Certain types of flowmeters for measuring the rate of flow of fluids are commonly provided with a calibrated resistor through which the fluid passes. The pressure drop across such a resistor is an index of the rate of flow.

It is usual to employ a capillary tube for this resistance element. To increase the resistance of the capillary tube to fluid flow, a wire is inserted in it over a portion of its length, the distance depending on the amount of resistance needed.

In order to obtain a precision adjustment for this wire, the invention provides, in addition to the capillary tube, a second tube connected to the delivery end of the capillary tube. This second tube has a wider inside diameter than the capillary tube, and the inner walls are threaded to receive a screw that is flat on two sides to permit the fluid to flow past it with ease.

A wire, not longer than the capillary tube, is positioned in the capillary tube, and one end is secured to the screw. Consequently, changing the position of the screw in the second tube correspondingly changes the distance to which the wire projects into the capillary tube.

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DEVICES FOR USE AS MICROAMMETERS AND POTENTIOMETERS
Patent No. 2,355,406 (D) Patent Date: August 8, 1944
Inventor: John B. Wilkie

The invention is an electrical instrument that can be used to measure very minute direct currents and potentials. It is especially useful in the precision measurement of currents generated by barrier layer photoelectric cells in connection with light transmittancy determinations.

The device makes use of a circuit containing in series a slide wire resistor, a battery, a meter, and several variable resistors. The slide wire resistor is also connected to the barrier layer photoelectric cell and to a null indicator through a triple pole double throw switch. A feature of the invention is the fact that it measures the current or potentials at the null point, thereby eliminating errors due to resistance factors.

See also Patent No. 2,064,517 (A), issued December 15, 1936, entitled Photoelectric Cell Circuit (Brooks A. Brice, inventor).

See also Patent No. 2,381,414 (D), issued August 7, 1945, entitled Measuring Instrument (John B. Wilkie, inventor).

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HIGH-FREQUENCY DESICCATOR

Patent No. 2,360,108 (A) Patent Date: October 10, 1944

Inventor: Alfred Christie

This invention is useful for dehydrating samples of materials, such as grains, flour, and so forth, to determine their moisture content.

The use of high frequency currents to effect localized heating is well known. The material to be heated is placed between two electrodes which are electrically connected to a source of high frequency current.

In dehydrating samples of grain, flour, and so forth, it is important that a uniform heating be applied to the samples. The intensity of heating of a high frequency heater diminishes along the electrodes in the direction away from the terminal or point of electrical connection. Consequently, when the electrodes are connected to the high frequency generator on the same side, a definite gradient of intensity will exist and will result in non-uniform heating of samples between them. To avoid this gradient of heat intensity, the terminals of the electrodes are placed at opposite ends. This puts the high points opposite the low points, as a result of which uniform heat intensity throughout the length of the electrodes is effected.

The electrodes are placed in a glass chamber that is provided with means for evacuating the air therein. A large number of samples can be dehydrated simultaneously.

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AGRICULTURAL AND ROAD EQUIPMENT

CUTTING EDGE BIT FOR GRADING EQUIPMENT

Patent No. 2,138,150 (D) Patent Date: November 29, 1938
Inventors: Theodore P. Flynn and Raymond E. Neils

The object of this invention is to provide simple means for attaching and detaching a cutting edge bit to the moldboard of a grading tractor.

The bit is provided with lugs that are integral with the bit and project from the back. The moldboard is provided with holes through which the lugs project when the bit is in proper position on the moldboard. The lugs are also provided with holes to receive spring wedge keys on the back side of the moldboard thereby holding the bit tightly against the face of the moldboard.

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ARCH TYPE ELECTRIC ROAD SWITCH

Patent No. 2,138,549 (D) Patent Date: November 29, 1938
Inventor: Oldric J. LaBell

This invention provides an electric switch for use on highways for actuating various devices by moving traffic.

Essentially, the device has a long, hollow, resilient outer casing, such as of rubber, and a similar inner casing that can be removed from the outer casing. In the crown of the inner casing, a metal electrical conductor is woven in a longitudinal direction. On the bottom of the inner casing, another electrical conductor is secured.

Traffic passing over the device forces the conductors in contact and the resilience of the casings separates them when the pressure is released.

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TRENCHING MACHINE

Patent No. 2,169,079 (D) Patent Date: August 8, 1939
Inventors: James H. Bosworth and Oscar Gordon Conrad

The object of this invention is to clean a narrow strip of grass, leaves, needles, and other vegetable matter off a forest floor down to mineral soil in order to prevent the spread of an approaching ground fire.

The device is suggestive of an ordinary wheelbarrow. It has a wheel in front and two handle bars behind. In the middle is a motor, and underneath of it are two assemblies of rotating hammers that are powered by the motor. As the vehicle is pushed along, these hammers strike the ground and tear it apart leaving a clean non-combustible strip. All the light top soil is thrown to one side.

The position of the hammers can be adjusted to throw the dirt in any direction desired and also to create one large trench or two smaller parallel trenches.

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METHOD OF PROVIDING PLANT CONTAINERS
Patent No. 2,186,912 (D) Patent Date: January 9, 1940
Inventors: Oswald K. Hoglund and Fred W. Herbert

A shallow box or flat is subdivided into units or compartments by means of removable interlocking partition strips that are slotted at each line of intersection. Strips of paper are then placed in these compartments and tamped with a wooden tool to make them conform to the shape of the compartments. Soil can then be placed in each compartment and the partition strips removed leaving a flat full of individual plant containers in which seeds may be sown or seedlings planted until such time as it is desired to remove them to larger containers.

The invention is useful in regular nursery production and in soil conservation work where it is desired to grow large quantities of plants for transplanting to soil erosion areas.

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PLANT PROPAGATING POT
Patent No. 2,202,664 (D) Patent Date: May 28, 1940
Inventor: Martin Leatherman

The life of paper and fabric plant pots is increased by impregnating the paper or fabric with rosin and 4 to 20% copper resinate. The presence of the copper resinate is indicated as exerting a stimulating influence on the growth of plants under favorable conditions.

See also Patent No. 2,129,190 (D) issued September 6, 1938 (same title and inventor).

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PNEUMATIC DETECTOR SWITCH
Patent No. 2,211,477 (D) Patent Date: August 13, 1940
Inventor: Olav K. Norman

This invention is a device for use in counting vehicles that pass a fixed point on a highway or street for the purpose of obtaining statistics in traffic problems.

The device contains a rubber sac like that used in some types of fountain pens which is adapted to receive air impulses from a rubber tube stretched across the highway. Each time the wheels of an automobile pass over the tube, an air impulse is generated. These impulses expand the sac slightly which actuates one arm of an electrical contact switch, thereby closing the switch which is in circuit with an electrical recording mechanism.

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CONVERTIBLE BRUSH BUSTER-BULLDOZER MOLDBOARD
Patent No. 2,219,159 (D) Patent Date: October 22, 1940
Inventors: Theodore P. Flynn and Raymond E. Neils

This invention provides moldboard pieces for a conventional bulldozer which can be readily assembled to form different types of moldboards. They comprise two half sections which are hinged to the front of the bulldozer on a central bracket so that they can be adjusted in various relations to each other, namely, a forward V, a rearward V, and a straight line, either

transverse or diagonal. Suitable connections are provided to hold the moldboard pieces in any of these various positions. Bridging headpieces are also provided for disposition across the two sections.

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ORCHARD HEATER

Patent No. 2,269,831 (D) Patent Date: January 13, 1942
Inventors: Arthur H. Senner and Richard E. Nest

The invention is an oil-burning type of heater for use in orchards during occassional periods of freezing temperatures. It is so constructed as to produce a minimum of soot and smoke. The combustion air is delivered down-draft to the flame through tubes that are positioned in the flame. In this way, the combustion air is preheated. Auxillary combustion air is also fed to the flame from the bottom. The fuel is atomized and fed to the combustion chamber through a spray nozzle which results in better combustion.

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ROTARY WEEDER FOR SINGLE ROW CULTIVATORS

Patent No. 2,275,380 (D) Patent Date: March 3, 1942
Inventors: Bert Kidman and William J. Davis

The invention is a device that can be attached to a cultivator, such as a corn cultivator, to cut or destroy weeds growing between plants standing in rows. The device has four working blades on a shaft, arranged so that only one is in contact with the ground, that is, grounded at any one time. As the grounded blade approaches a plant in the row being cultivated, a trip mechanism permits the shaft and blades to turn a quarter of a turn at a time so that the plant is not injured. This forces the grounded blade out of line of the approaching plant while a succeeding blade becomes grounded in front of the plant and remains in that position until the next plant is reached, whereupon the mechanism is tripped again, and so on.

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SUBSOIL STALK CUTTER

Patent No. 2,281,779 (D) Patent Date: May 5, 1942
Inventor: Robert E. McDonald

In order to combat pink bollworm of cotton, the plants must be destroyed after harvesting. This is especially necessary in localities where the winter and fall seasons are mild, since the plants after harvesting have a tendency to sprout from the roots and bear fruit, thereby propagating the pink bollworm. To destroy the plants, it is necessary to cut them off 3 to 6 inches below the surface of the ground and to sever all lateral roots.

This invention provides a device for destroying these plants in this way. It comprises a cutter bar which slides below the ground to cut the stalks and a rod attached to the outer end of the cutter bar at such an angle that it is effective in severing the lateral roots.

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MACHINES FOR HARVESTING FLAX AND SIMILAR PLANTS

Patent No. 2,291,093 (D) Patent Date: July 28, 1942

Inventors: Wilbur Magruder Hurst and Leonard M. Klein

This invention is in its entirety a machine which can be used to harvest plants, such as flax. It is designed to be an improvement over previous types of flax harvesters. One of its features resides in the fact that its delivery end is sufficiently narrow to permit its operation in the mouth of a vertical binder and still the machine will cut a wide swath.

The machine is a novel combination of cooperating belts and pulleys arranged in an inclined position behind diverters so as to grip the standing flax and move it upward and rearwardly until it is loose from the ground. It is then delivered to the rear at a narrow point which may operate in the mouth of a vertical binder.

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HINGED MOLDBOARD PLOW

Patent No. 2,326,097 (A) Patent Date: August 3, 1943

Inventors: Glen M. Horner and Loy M. Naffziger

This invention relates to moldboard plows of the hinged type, and its purpose is to provide means for quickly adjusting the position of the hinged moldboard while the plow is in motion.

Plows are secured to the frame of a suitable vehicle. The moldboards are attached to the plows by hinges in the usual manner and are connected together with a forklike member, each prong of the fork being pivoted to the back of one of the moldboards. A bent shaft has one end connected to the fork and a system of levers is provided for turning the shaft which then moves all the moldboards simultaneously. This movement can be effected while the plows are in operation.

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EARTH MOVING MACHINE

Patent No. 2,343,795 (A) Patent Date: March 7, 1944

Inventor: James J. Pellett

The invention is, in general, a machine suitable for ditching, grading, terracing, etc. It is light in weight, of simple design, has a large capacity, and is easy to operate.

The machine has many parts corresponding to a conventional plow, but provides a blade for conveying soil laterally of the direction of motion of the machine. The blade is mounted at an angle, with its forward end positioned immediately behind the moldboard attached to the plowshare. As the soil is raised by the share, it is guided onto the blade and is conveyed to one side.

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ROTARY SUBSOILER

Patent No. 2,240,994 (D) Patent Date: May 6, 1941
Inventor: Leslie E. Love

This invention is an agricultural implement for making a furrow or opening in soil without materially disturbing the vegetation or top soil. The provision of such furrows has many applications in farming operations, including the introduction of water to the subsoil or lower layers of top soil to provide moisture to plant roots.

In its simplest form the invention consists of a tapered wheel having a sharp edged rim which is free to contact the ground and rotate on one end of a vertical crank arm. The other end of the crank arm is pivoted to the frame of a vehicle that can be drawn through the field. An abutment is provided on the vehicle below the pivot point to hold the crank arm in a vertical position when the cutting wheel is in contact with the ground to a given depth.

In action, the wheel cuts the ground while it rotates and leaves a tapered furrow.

A modification of the invention permits variations in the shape of the furrow. This is accomplished by fabricating the wheel of a flat central disc having a cutting edge at the periphery and outwardly bowed discs on either side of the central disc. By selecting side discs of different shapes, different furrow patterns may be obtained. Means are provided for interchanging different side discs at will.

* * * * * *

OTHER MECHANICAL AND ELECTRICAL DEVICES AND PROCESSES

FABRIC BAG FOR FRUITS AND VEGETABLES

Patent No. 1,942,186 (D) Patent Date: January 2, 1934
Inventor: Robert J.Cheatham

This invention provides a fabric bag for use in the shipping, handling and marketing of fruits and vegetables.

One side of the bag is of a close-mesh fabric and the other side of an open-mesh fabric. This permits the printing and stamping of indicia, such as brands, weight, etc., on one side of the bag, at the same time permitting inspection of the contents from the other side. It, therefore, combines the advantages of bags made wholly of closed-mesh fabric and of those made wholly of open-mesh fabric without suffering any of their disadvantages.

* * * * * *

RECORDING AND PROJECTING SOUND ON FILM APPARATUS

Patent No. 1,999,754 (A) Patent Date: April 30, 1935
Inventor: Raymond Evans

This invention provides a method of recording and projecting sound on moving picture film that can be used on 35 and 16 millimeter film and is adapted for use on portable equipment in the school, home or elsewhere by non-professional operators.

The track is made on a corner of one edge of the film in hills and valleys by a chiseling tool attached to a recording unit. The film is heated somewhat, just before it passes under the chiseling tool, by a hot wire that makes the film plastic for a sufficient length of time to be operated on by the chiseling tool.

The sound is reproduceable by a simple mechanical phonograph mechanism using as the "needle" a chisel-like tool, instead of a pointed needle.

* * * * * *

TORCH

Patent No. 2,017,454 (D) Patent Date: October 15, 1935
Inventor: Fred W. Funke

This invention is a flame thrower for use in setting back fires in the suppression of forest fires.

Liquid fuel is forced through a long tube under pressure and then through a nozzle which aerates it. At the forward end of the tube, a taper or igniter is disposed which contacts and ignites the aerated stream of fuel as it leaves the nozzle.

* * * * * *

HOG-TONGUE GUARD

Patent No. 2,062,554 (D) Patent Date: December 1, 1936
Inventor: John A. Carlsen

During the processing of a hog carcass in the meat-packing industry certain apparatus, particularly the dehairing machine, is instrumental in mutiliating the hog's tongue, thereby destroying or materially reducing its usefulness for food purposes. To avoid such waste, the invention covered by this patent provides a device which can be placed in the mouth of the hog to protect the tongue against destruction. The device also keeps the jaws of the hog spread apart to permit singeing of the mouth by heating torches. This obviates the necessity of shaving the head of the hog by hand operations.

Essentially, the device comprises two plates hinged together at one end. One plate is adapted to engage and protect the hog's tongue and the other to engage the roof of his mouth. The latter plate is provided with saw-like edges to grip the roof of the mouth and hold the device in place. The free ends of the plates are in normal position urged apart by a stiff spring. Means are also provided for holding the plates in a retracted position preparatory to placing the device in the hog's mouth.

* * * * * *

APPARATUS FOR DRYING SEED COTTON

Patent No. 2,078,309 (D) Patent Date: April 27, 1937
Inventor: Charles Abel Bennett

This invention is an improvement over what is known as the "Government process" for drying seed cotton.

The "Government process" includes treating damp seed cotton with a continuous current of from 40 to 100 cubic feet of hot air per pound of cotton. The temperature of the air is preferably between 150° and 160° F. and the period of heating about 15 seconds to 3 minutes.

In accordance with this invention, a current of heated air from one source and a current of cold air from another source on which the seed cotton is conveyed, are brought together in an airline type of cleaner through a split suction inlet device. The seed cotton becomes agitated in the resulting hot mixture of the two air volumes and obtains a satisfactory degree of dryness.

See also Patent No. 1,871,773 (D) (same title and inventor), issued on April 16, 1932.

* * * * * *

ROUTING MACHINE

Patent No. 2,177,347 (D) Patent Date: October 24, 1939
Inventors: Herman A. Sedelmeyer and Edward A. Meldrum

This is a machine for making relief maps out of a precast block of material, such as plaster of Paris, from an ordinary two dimensional contour map.

The map is placed on one table, and the block of material on another. These tables are vertically adjustable. A pointer is provided for the map and a routing or cutting tool for the plaster block, and they are supported

and coordinated in movement by a pantograph. As the pointer is guided along a contour line of the map, the routing tool cuts out a corresponding line in the plaster block. The tables are then readjusted for the next contour line and another cut is made. This is repeated for each contour line of the map.

The step-like formation of the resulting carved material may be overcome by filling it in with molding clay.

* * * * * *

FOLDING PORTABLE STEREOSCOPE
Patent No. 2,178,324 (D) Patent Date: October 31, 1939
Inventors: Jasper E. King and Vernon R. Powell

This is a simple mirror stereoscope supported on a wire stand for use in viewing stereoscopic pictures lying on a table. The instrument is so constructed that it can be compactly folded when not in use.

* * * * * *

FIRE MAT
Patent No. 2,183,113 (D) Patent Date: December 12, 1939
Inventor: Frank Willard Bennett

The device of this invention is useful for quickly controlling fast spreading surface fires, such as the grass fires commonly occuring in some of the southern and western regions of the United States.

The device is of simple construction and consists of a mat having a top and bottom canvas section. These sections are stitched together at random points. Means are provided for filling the space between these two sections with water or some other fire extinguishing liquid such as monoammonium sulfate. Two ropes are attached to one end of the mat for the purpose of pulling it across the surface fire. The smothering effect of the drag plus the dampening effect of the liquid extinguishes the fire as the mat is dragged along the ground.

* * * * * *

GRAPHIC RADIAL TRIANGULATION
Patent No. 2,221,872 (A) Patent Date: November 19, 1940
Inventors: Jasper E. King and John W. Elliott

This invention is for use in assembling vertical aerial photographs of the type used in aerial surveying for the purpose of making a composite map from such photographs. The photographs are taken from an airplane with the lense of the camera pointed downward. Exposures are timed with the speed of the plane so that successive pictures overlap each other by about 60 percent.

The invention itself consists of interconnected units, each unit being a templet representing the location along radial lines of selected reference points of the photographs. These unit templets are each made up of a post representing the center of the photograph and arms representing central angles thereof. The arms are held in grooves of washers placed on the posts and a wing nut on the top of each post clamps the washers in position so that the angular relation of the arms relative to each other can be temporarily

fixed for each unit while permitting radial movement of the arms in the grooves of the washers. The outer ends of the arms have holes, so that arms of adjacent units representing the same reference point on different pictures can be connected together with a pin through the holes. Units tied together in this way can be extended and contracted in coordination to fit a sketeton of fixed or basic reference points determined from actual ground data or control. In this manner a solution is obtained of the location of the reference points relative to each other which may be transferred to a base sheet to afford data for compiling the map.

* * * * * *

SPRAY NOZZLE TIP

Patent No. 2,263,405 (D) Patent Date: November 18, 1941

Inventor: Frederick W. Funke

In firefighting, the use of a water spray is more effective than a solid stream of water. This invention provides a simply constructed nozzle tip for attachment to fire hoses for producing vapor streams efficiently at low pressures and under varying pressures and discharge rates. Such vapor streams are also useful in protecting firefighters against the intense heat of fires which they fight.

The device is cylindrical in shape and has a front and rear wall held apart to form a chamber between them. The rear wall has a number of holes near the periphery, while the front wall has a single hole in the center. Water enters the holes through the rear wall under pressure and fills the chamber which acts as a reservoir and is large enough to permit the water to lose its turbulence before being discharged through the center hole in the forward wall. Converging streams of water through the reservoir chamber impinge on the center hole and result in pressure equalization before issuing through the center hole. This produces a spray pattern, the diameter of which depends upon the spacing between the two walls.

* * * * * *

STEREOSCOPIC PLOTTER

Patent No. 2,263,971 (A) Patent Date: November 25, 1941

Inventors: Jasper E. King, John W. Elliot and Philip B. Kail

The device is known generally as the KEK (King, Elliot and Kail) plotter. It is a precision instrument which can be used to reproduce topographic and contour lines from a pair of aerial photographs (photographs taken vertically from airplanes) having a stereoscopic overlap.

The instrument comprises three principal parts: (1) Tables for holding and adjusting the relative positions of the photographs; (2) a stereoscope for viewing the pictures, and (3) a pair of reference marks, one for each eye, between the stereoscope and the pictures. The reference marks appear to fuse into a single dot when the operator looks through the stereoscope. These marks are movable horizontally, and their fused image can be made to appear to touch any part of the stereoscopic image of the photographs by moving the pictures in unison vertically.

See also Patent No. 2,351,769 (A) (Albert J. Kramer, inventor), issued June 20, 1944, entitled Plotting Instruments, and Patent No. 2,380,103 (A) (Theodore P. Flynn and Albert J. Kramer, inventors), also entitled Plotting Instruments, issued July 10, 1945.

* * * * * *

FASTENING

Patent No. 2,268,323 (D) Patent Date: December 30, 1941
Inventors: Theodore J. Martin and Arthur Van Kleeck

Metal fastening devices, such as nails, are usually smooth and bright. This reduces the resistance between it and the material into which it is embedded. To increase this resistance, the invention provides a treatment which results in the nails or other metal fastening devices becoming etched in a simple and efficient manner and hence more resistant to withdrawal. The simplicity of the method is the principal advantage of the invention.

The method consists in treating the material with a water solution of monoammonium phosphate for about 7 hours at room temperature. It is then withdrawn, washed and dried.

The resistance to withdrawal of wire nails was increased by this method greater than by other methods, such as sandblasting and the usual phosphate treatment.

See also Patent No. 1,911,421 (D), issued May 30, 1933 (Edward Beglinger and John M. Gahagan, inventors), entitled Metal Fastening and Process for Manufacturing the Same, wherein the treatment is effected with a water solution of ferric chloride and the salt of another metal falling below iron in the electromotive series, such as mercuric chloride.

* * * * * *

MATERIALS-CONVEYING FLUE

Patent No. 2,344,528 (A) Patent Date: March 21, 1944
Inventor: Clarence M. Asbill, Jr.

In material-conveying flues, such as those used to transfer cotton lint by air blast, the action of the fan or irregularities of the flue, or a combination of these factors, induces a spiraling motion to the air stream and adversely affects materials, such as long staple cotton, by causing the lint to rope and become tangled.

To avoid this, the invention provides a longitudinal fin on the inside of the flue to block any spiraling tendency of the air. The fin is streamlined and provided with a beaded end to prevent damage to the material being conveyed through the flue.

* * * * * *

FRACTIONATING COLUMN AND SCRUBBING TOWER

Patent No. 2,344,560 (D) Patent Date: March 21, 1944
Inventors: Samuel Palkin and Stanley A. Hall

The invention relates to a new type of packing for fractionating columns or scrubbing towers.

Instead of the usual bubbles plates, rashig rings, and other packing materials, the invention provides means for spreading the reflux in thin films over the surface of vertical rods or tubes which contact the rising vapors from the still pot. This avoids channeling and other undesirable effects of previous packing materials. It results in increased capacity and relatively low H.E.T.P.

* * * * * *

METHOD AND APPARATUS FOR CONTROLLING THE CIRCULATION OF AIR IN REFRIGERATOR CARS

Patent No. 2,346,931 (A) Patent Date: April 18, 1944
Inventor: Charles W. Mann

Standard railroad refrigerator cars are provided at either end with bunkers where ice is placed to keep the lading cool. However, in many cases, the lading is precooled by introducing cool air into the car from an outside source. Little attention was heretofore paid to the manner in which such precooling air was circulated through the lading. The result was inefficiency and ineffectiveness from the point of view of uniformity in cooling.

This invention provides a method for effectively precooling such cars by a system of baffles and deflectors which does not require any change in car structure or the use of expensive or complex equipment. The air is introduced into the top of one of the ice bunkers and deflected through its top bulkhead opening across the lading in a path which carries it downward and in and around the lading. It finally emerges at the top bulkhead opening of the other bunker and is deflected out of the opening above it.

See Patent No. 1,935,590 (D), issued November 14, 1933 (Edward A. Gorman, inventor), entitled Mechanical Means for Circulating Air in Enclosed Spaces.

See also Patent No. 2,260,999 (D), (Charles W. Mann, inventor) issued October 28, 1941, entitled Method of Circulating Air in Refrigerator Cars.

* * * * * *

PRESSURE-MEMBRANE EXTRACTION APPARATUS

Patent No. 2,353,760 (D) Patent Date: July 18, 1944
Inventor: Lorenzo A. Richards

By the use of this invention, liquids may be extracted from materials that are porous, permeable or granular.

The principle underlying the invention requires the establishment of a continuous gas phase throughout the material while in contact with a porous membrane, such as cellophane. This is accomplished by providing a chamber, one wall of which comprises a sheet of cellophane (or other suitable porous material) reinforced against pressure from the inside. The material from which liquid is to be extracted is placed in the chamber, and a gas is introduced under pressure to establish a continuous gas phase through the material. Means are provided to keep the material in contact with the cellophane. Liquid from the material being treated touches the membrane and forms a meniscus with the gas across each pore of the cellophane. This meniscus prevents gas from escaping through the pores and will have a definite curvature depending upon the magnitude of the gas pressure. Therefore,when liquid from the material flows into a meniscus, an equivalent amount of liquid is forced outward through the other end without

the loss of gas, thereby permitting the maintenance of a constant pressure inside the chamber.

The degree to which liquid can be extracted from a material by this method is very high and it can, furthermore, be used for materials that are relatively incompressible.

* * * * * *

FILTER MEDIUM

Patent No. 2,372,437 (A) Patent Date: March 27, 1945
Inventors: Elbert C. Lathrop and Samuel I. Aronovsky

The invention provides inexpensive felted sheets having properties suitable for use in gas mask filters. It is made of relatively short and thin cellulosic fibers of agricultural residues, such as cereal straws, annul grasses, stalks, stems, and weeds, in admixture with the longer cellulosic fibers.

The high adsorption properties of these agricultural waste fibers is attributed to their high natural ash content, consisting mainly of silica, uniformly distributed, and, in the case of some fibers, such as straw, finely serrated walls which tend to increase the surface areas available for adsorption.

* * * * * *

PARACHUTE

Patent No. 2,384,416 (D) Patent Date: September 4, 1945
Inventor: Frank M. Derry

This invention is an improvement in the construction of parachutes. The object is to provide a parachute which can be guided by the occupant while decending.

This objective is accomplished by providing specially formed radial slits in the canopy which can be opened and closed by the parachutist pulling on control lines. When these slits are open, the air rushing through is directed to one side causing jet reaction which urges the parachute in the opposite direction. By placing the slits at proper points on the canopy better control of the parachute may be effected.

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